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Microsoft and Novell are reading software metering tools and APIs. See page 53

MHS E-mail: the good, bad, and missing

Our Enterprise Team runs nine products through an interoperability gauntlet. See page 68

APRIL 5, 1993

THE VOICE OF PERSONAL COMPUTING IN THE ENTERPRISE

VOLUME 15, ISSUE 14

Apple pushes enterprise with Oracle alliance

BY SHAWN WILLET

Apple Computer Inc. will try to convince corporate users this week that it is serious about making Apple a client/server downsizing platform.

The company will announce the alliance with Oracle Corp. at

the Apple Enterprise Computing Conference in San Francisco. The alliance calls for Oracle to port its Oracle7 database to Apple's new A/UX servers.

Additionally, sources said Oracle will take the servers under its corporate service, support, and integration umbrella. Oracle has already pledged numerous tools for Macintosh clients with its Cooperative Development Environment suite.

"There is a lot more in this for Apple than for Oracle," said analyst Brad Day of Dataquest, in Framingham, Mass. "Oracle has

See **APPLE**, page 8

Delrina plans to beef up technical support service

Addresses compatibility problems

BY SHAWN WILLET

Delrina Corp., admitting growing pains, said it is responding to customer complaints about technical support by adding staff and to problems with its WinFax software by releasing a fix to handle an incompatibility with high-speed modems. Most of the problems, com-



municated on InfoWorld's gripe line, public BBSes, and experienced by the InfoWorld Test Center, relate to incompatibility problems and memory conflicts with Windows 3.1.

This week, Delrina will release on CompuServe a new WINDOW.S.COM driver that re-

See **DELIRIA**, page 103

Gates unveils MS-DOS 6.0



Microsoft chairman Bill Gates introduced MS-DOS 6.0 last week in San Francisco. He assured users that DOS will be around for a while but said the next version will be the biggest change since the operating system was introduced.

IBM customers want downsizing guidance

Want help moving off mainframes

BY ED SCANNELL AND SHAWN WILLET

As Louis Gerstner took control of IBM's future last week, the company's largest customers said they will measure his success by how he guides customers from proprietary mainframes to open, microprocessor-based technologies.

But the new IBM CEO's first priority, most believe, is to reduce or redeploy IBM's mammoth work force.

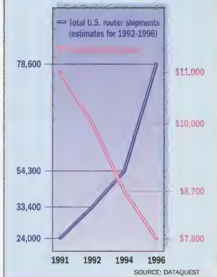
Indeed, by Gerstner's first day on the job last Thursday, IBM had announced its most recent

cuts: nearly 14,000 jobs. The jobs include 500 in Boca Raton, Fla.; 1,300 in mainframe facilities in upstate New York; 1,900 in Rochester, Minn.; and 10,000 jobs from IBM Europe, long a trouble spot for the company's bottom line.

Long term, corporate IS managers want Gerstner — a man who knows more about selling Orcos than million-dollar multi-processing systems — to tell them how to downsize cost-effectively.

Many want to move from IBM's aging 370 architecture. See **IBM**, page 103

U.S. router shipments climb, prices fall



Gerstner era won't impact us, Sculley says

BY TOM QUINLAN

The landmark alliance between Apple and IBM is unlikely to change under the Louis Gerstner regime at IBM, but if it does, Apple will continue product development on its own, John Sculley said last week.

"As of [two] weeks ago, IBM was still very enthusiastic about working with us," Apple Computer Inc.'s CEO and chairman said. "They have said this strategic partnership was the best one they have ever had in the history of the company."

With an interlocking network of agreements, contracts, and See **SCULLEY**, page 103

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NEWS

Painter extension lets artist treat bit maps as objects

Allows users to move elements

By JEANNETTE BORZO

An extension to Fractal Design Corp.'s Painter gives Macintosh and Windows users more creative freedom by using bit-mapped images as if they were objects.

Painter/X2 is an extension to Painter 2.0, the \$399 natural media graphics package that debuted last year. The \$149 Painter/X2 is due to ship to Mac users in May and to Windows users shortly after.

Offering functionality similar to Painter/X2, Altamira Software Corp.'s Composer is scheduled to ship to Windows users this summer. (See "Composer" turns bit maps into objects," March 8, page 1.)

Painter/X2's main feature is multiple floating selections, which let users easily move or modify bit-mapped images once they are placed on the electronic canvas.

"It's like working with Illustrator or FreeHand but dealing with bit-map images," said beta tester Mike Koehler, a graphic artist at Electric Paint, in Hollywood, Calif. "I think it is going to revolutionize the way people are doing things."

Electric Paint's creative director, Todd Reublin, said, "If you



Painter/X2 lets users 'float' multiple images in a bit-map composition and manipulate them like objects in a vector program.

decide [an image] needs to be moved a pixel or two, you don't have to recompose the type or the graphic. Bring it up a week later, and [the images] are still floating."

Some analysts view the option to modify bit maps in this manner as a new battleground in the graphics-software feature war. "The next paradigm in vector editors is to treat images as vector graphics," said Michael Kieran, author of *Desktop Publishing in Color*.

Painter/X2 also offers multiple levels of masking, the option to paint directly into a mask, a portfolio for storing visual items

for future use, support for multiple color sets, and an annotation feature that automatically labels colors.

Beta testers said the capability to treat images as vector graphics is a tremendous time-saver that can decrease the user's dependence on multiple programs for graphic composition.

"I used to go in and out of three different programs to do compositing," said Daniel Clark, principal at Daniel Clark Design, in Glendale, Calif. "I've done stuff [with Painter/X2] in 25 percent of the time that it was normally take."

NT is shaping up, say latest beta users

But they want a bug-free final version, even if it's late

By STUART J. JOHNSTON

Users of Windows NT's final beta said they are pleased with its overall performance and stability. However, they prefer that Microsoft Corp. release a bug-free product rather than one on time.

"The danger is in shipping too soon rather than too late," said a beta tester at a company with thousands of PCs.

When Microsoft Corp. committed last fall to shipping the NT server and desktop versions by the end of the second quarter, officials recently said the date may slip by as many as 30 days. (See "NT server edition set for remote access," March 15, page 1.)

Windows NT was originally scheduled to ship in final form

by the end of 1992.

Most beta sites described the March release as stable and significantly faster and smaller than the previous end-user beta, which shipped in October and November. "They're within striking distance [of a final-release product]," said another beta tester. "There's nothing catastrophic about it — it's just a lot of little things."

In fact, as the March release covers an expanded test base — this beta will eventually reach 70,000 sites — users expect that many, mostly minor, bugs will be found.



Some bugs fitting that description have already surfaced.

"[For example,] if you write a 16-bit PowerPoint [for Windows] file to disk, [NT] corrupts the file," said one beta tester, who was, nonetheless, enthusiastic about the program.

Also, the automatic hardware sensing and configuration feature "doesn't seem to let you select your own IRQs [hardware interrupts]," said the same user.

Despite the overwhelming enthusiasm expressed by most beta testers, a few confessed to misgivings about the latest beta. "I'm not as impressed as I'm supposed to be," said the technology director of one large international corporation. Another tester predicted that minor bugs will cause Microsoft to ship NT later than the third quarter.

AT DEADLINE

Intel, Siemens bringing phones and PCs together

Intel Corp. and Siemens/Rolm, a PBX company, last week announced they are jointly developing products that integrate PCs and telephones.

An add-in card that brings telephone functions to the PC is due sometime this year, the companies said. They declined to say whether future products would be in the areas of audio, video, and data conferencing or collaborative computing. Forthcoming products will support industry-standard telecommunication interfaces, they said.

Intel confirmed that it is working with Microsoft Corp. to develop a telephone application programming interface (API) but declined to comment on whether that API is one of the interfaces the Siemens-Intel products will support. A Microsoft representative said Siemens is reviewing the joint Microsoft-Intel API.

— Cate Corcoran

Borland dumps support of some apps

Borland International Inc. notified users via CompuServe that it is unbundling support on some of its noncore products, such as Apple, Eureka, Sprint, FullWrite, MultiMate, SuperKey, and others. Users will have to pay for support contracts through SST, an independent company. The products have not been under development for years, and they represent between 2 and 4 percent of the company's support calls, according to Borland.

— Shawn Willett

Canon to announce notebook/printer

Canon Inc. today will announce a combined notebook and ink-jet printer, according to sources inside and outside of the company. The computer is part of a joint venture between IBM Japan Ltd. and Canon. A similar model has been shipping since February in Japan as the ThinkPad 550BJ. Users insert paper under the IBM 486SLC-based computer's keyboard, and printed sheets come out the back. The computer is manufactured in Japan by IBM, but Canon will market it in the United States, said a company representative.

— Yvonne Lee

XPress for Windows to get EfiColor

QuarkXPress 3.2 for Windows will give users access to the same EfiColor XTension that will be in Version 3.2 for the Macintosh. Developed by Electronics for Imaging Inc., the extension lets users separate continuous-tone color images in XPress, assuring consistent color matching across a variety of display and output devices. Quark Inc. will announce Version 3.2 for Windows next week at Seybold Seminars 93, in Boston. A release date has not been set. Version 3.2 for the Mac, originally due to ship before Seybold, is now scheduled for release in May.

— Jeannette Borzo

ThinkPad 710T tablet ships from IBM

IBM announced late last week the availability of the ThinkPad 710T tablet. A 5½-pound version of the IBM 486SLC-based tablet with a PCMCIA Type III slot and a Type II slot for inserting peripheral and memory cards costs \$2,999. A 5.8-pound version with a hard drive and a Type II slot bundled with PenDOS costs \$3,599. The same system with PenPoint costs \$3,699. Current users of the ThinkPad 700T will be able to trade them in for the 710T at no cost.

— Yvonne Lee

Lotus to add multimedia to full line

Lotus Development Corp. plans to add standard multimedia components from Freelance, its presentation graphics package, to all its major applications, starting with the Notes 3 client software for Windows. Lotus Sound, Media Manager, and Annotator, which play sounds and attach and manage multimedia files, will be included in the next release of Notes for Windows. The first versions of Notes software for OS/2, Macintosh, and Unix will not include these capabilities, but Lotus hopes to add them in future releases.

— Doug Barney



Distributed Thinking / Stewart Alsop

Cable TV may pass phone companies on data superhighway

The computer industry is captivated by the promise of high-speed telephone networks for data communications. But I had a fascinating experience last week that opened my eyes to another network out there: cable television.

Last Wednesday at the Intermedia conference in San Jose, Calif., I moderated a panel of four truly interesting people: John Sculley of Apple Computer Inc., Bill Gates of Microsoft Corp., Barry Diller of QVC (the other home shopping network on cable television), and John Malone of Telecommunications Inc. (the largest cable network in the United States). The panel was formed to discuss the convergence of different industries including television broadcasting, cable television, telephone, computer, consumer electronics, publishing, and recording — through digital technologies.

It became clear that while Apple is looking at the telecommunications industry as the key to persistent networking, Microsoft has invested a significant amount of effort in understanding the

cable television network. And, from comments that both Gates and Malone made, the cable business may have a good chance of installing an interactive, high-bandwidth network before the telephone companies get there.

Malone paints a picture of using the existing cable wiring to hook together a really big local area network. On that network will be media servers running something like Microsoft NT (the impression that Bill Gates was certainly trying to give) on a really fast computer with huge disks. An application on the server would allow individual customers (millions of individual customers, by the way) to select and request a particular movie from their cable box, attached to their TV sets, and have the server deliver it to the screen in real time. That's only one application, but it's indicative of the kind of computer power that would reside in this system.

Then I recalled listening to Bob Carberry of IBM talk about delivering media servers based on OS/2 and AIX this summer. IBM's been working with the phone companies, such as Bell Atlantic, on this project. These servers appear to be exactly what Malone wants for TCI's network. In this case, IBM

appears to be ahead of Microsoft in understanding the business opportunity and being ready to deliver a solution.

More important, this gives us a foundation to build on: a high-bandwidth network populated with powerful media servers. It wouldn't be difficult to extend the cable connection into your office wiring closet, so why couldn't the cable system become an extension of your office network and be the primary resource for acquiring and archiving video and other high-density information?

After this discussion, some people said we should have had someone from the telephone business there to provide a different point of view. I don't agree. The strategy of the telephone business for upgrading its network is well-known: Finish installing fiber to the entire switching system and then offer both business and individual subscribers the ability to make a digital connection to that fiber network through ISDN. Then the phone companies hope to get big corporate customers to move to asynchronous transfer mode (ATM), and they will offer residential customers relatively high transmission rates on asymmetrical digital subscriber line (or ADSL, which Bellcore has developed to

allow video transmission on regular phone lines).

The discussion made it clear to me that TCI (and maybe the entire cable industry) has a pretty clear strategy for upgrading its system. And that strategy may well make it competitive with the telephone system and offer computer customers a real choice sooner than any one thought.

DEAR INTERNET READER

Personal to the fellow on the Internet who wants to know how to send MCI Mail to Verna: MCI Mail uses a first initial, last name format for addresses. For example, my address on MCI Mail is either `alsop@250-8917`. So you can send me mail either via the Internet at `alsop@mci.com` (first initial and last name, but that may not be unique) or at `0002508917@mci.com` (add three leading zeros to the numerical ID, which is guaranteed to be unique). The mistake you made was to leave out the mail part of `mci.com`. Good luck with Verna. And don't forget to include your return address in messages you send to people on Internet because some gateways tear off the part of the envelope with the return address on it.

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This One



SJNT-L9K-WD6T

Notes will let client PCs view video from server

By DOUG BARNEY

A Notes video server for distributing motion video to end-users may ship by the end of the year, a Lotus Development Corp. official said last week.

Video Notes will deliver high-quality video on demand without a special digital video card on the client PC. With systems

based on Intel Corp.'s Pentium processor, users could view video at 30 frames per second, according to Steve Barlow, Lotus product manager.

Lotus currently supports attached video clips through Microsoft Corp.'s Object Linking and Embedding (OLE). However, under OLE the video is downloaded to the client for viewing.

Lotus advocates keeping the video on the server and viewing it over the network. "It's too hard to send a document with a 50MB video piece in it," Barlow said.

The firm is currently working with makers of high-speed networking hubs and developers of special video transmission protocols to develop such a system.

"By putting smart hubs on your LAN, you can get enough aggregate bandwidth in the wires to move the video in real time and play it right off your server," said Chris Herot, director of advanced technology for Lotus.

Such a configuration would let 20 to 30 users simultaneously access video from a single server. Video software from firms such as Starlight Networks Inc. provides video server capabilities on a range of operating systems including NetWare, LAN Manager, and Banyan Vines.

Analysts see Video Notes as another step on the way to supporting all kinds of information types. "First it was documents, then images, and video seems like a natural extension," said Ann Palermo of International Data Corp., in Framingham, Mass.



Apple brings recent hardware upgrades to its Performa line

By TOM QUINLAN

Apple Computer Inc. will announce next week upgrades to its consumer-oriented Performa line with new versions of the 200 and 400 systems, as well as price cuts to its high-end 600 machines.

The systems will be based on Apple's recently introduced Color Classic and the LC III, sources said. They will continue to be priced slightly higher than their Macintosh counterparts. No shipping date has been announced.

Pricing for the Performa 200 version of the Color Classic, which includes a 10-inch color monitor and an LC-compatible expansion slot, is expected to be between \$1,450 and \$1,500 with 4MB of RAM and an 80MB hard drive.

The Performa 400, without a monitor or keyboard, will have a similar price, sources said. It comes equipped with a faster 25-MHz 68030 processor.

Apple will bundle a variety of software with the Performa series, including its At Ease user interface and applications software.

Although Apple has not officially discontinued the Classic II and the LC II designs on which the original Performa 200 and 400 systems were based, retailers are already making way for the new systems.

Apple will continue to offer its Performa 600 system, although the company is expected to reduce the price of the basic system to about \$1,800.

A CD-ROM-equipped version of the system — which includes 4MB of RAM, a 120MB hard drive and a 32-MHz 68030 processor — will also be priced at about \$2,200, or \$300 more than its current price, sources said.

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Correction

The Compaq LTE Lite 4/25C, reviewed in our March 22 comparison of color notebooks (page 72), uses a 25-MHz 486SL processor, not a 486SX as stated.

OKAY. WHAT'S THE CATCH?



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Sun's Scott McNeely (left) and SunSoft president Ed Zander roll out Solaris for Intel and pledge support for the PowerPC.

Solaris port to Intel platform gets corporate user laurels

BY CHERYL GERBER

Sun Microsystems Inc. drew kudos from corporate users last week when it took the lid off Solaris for Intel Corp.'s x86 platform and pledged to port to the PowerPC.

"We've been surprised at how robust and functional it is compared to how balky and cantankerous we expected it to be," said Dave Pensak, corporate advisor of computing technology for Du Pont.

SunSoft Inc., the software subsidiary of Sun, boosted the Solaris operating system in several key enterprise areas.

Enhancements include multithreading that speeds I/O processing, support for symmetric multiprocessing, systems administration and security improvements, and a suite of services for application development, networking, and productivity.

"It's a totally object-oriented environment and completely extensible. That, and the fact that it's on x86 now, dovetails into our overall strategic architecture," said Jon Ricker, vice president of corporate systems de-

velopment at Federal Express. Solaris also will run on the RISC-based PowerPC, under development by Motorola Inc., IBM, and Apple Computer Inc. Those companies hope to establish it as an industry-standard alternative to the Intel platform.

"We will have support for the PowerPC by early next year," said Scott McNeely, Sun's CEO.

Pensak said his only concern was network — not systems — security, but that was an issue he has with Unix in general, not Solaris specifically.

"We have 20,000 x86 machines. We cannot afford to throw them away and replace them with Unix boxes," Pensak added. "This could give us a way to move to open systems enterprise computing without losing our investment."

SunSoft will ship a single-client desktop version of Solaris 2 for x86 or Sparc in May for \$795 through a broadened distribution network.

Companies such as AST Research Inc., Dell Computer Corp., and Toshiba, as well as 88 independent software vendors, said they will support Solaris.

BY STUART J. JOHNSTON

CHICAGO — Microsoft Corp. will ship this month beta versions of tools that let developers easily convert Windows code to run on the Apple Macintosh.

"Key to our strategy is preserving the investment that people have made in Windows," chairman Bill Gates told attendees of the Corporate Association for Microcomputer Professionals' Exposition here last week. Microsoft will also make similar tools available for popular versions of Unix, he said.

The move could help to make Windows the dominant programming interface on both the Mac and Unix. Microsoft currently ships more than a million units of Windows per month. Gates predicts Windows will have an installed base of 100 million by 1996.

BY DOUG BARNEY

Six months after its rollout, Microsoft Corp.'s Access is making headway in the corporate market.

Freightliner Corp. chose Access as a development and end-user tool, said Larry Baldridge, director of systems development for the Portland, Ore.-based truck manufacturer.

Access was chosen based on its ease of use, interoperability with other Microsoft applications, ties to SQL Server, and promised enhancements.

Access 1.1, due to ship in the middle of the second quarter, adds connectivity to Oracle and Sybase SQL Server, enhanced Open Database Connectivity support, and smoother integration with Microsoft Word and Excel, said Mary Engstrom, group product manager for Access at Microsoft.

"There were a few bugs here and there [in Version 1.0], and

The Mac tools, which are scheduled to ship in the fall, consist of a cross compiler and run-time libraries that enable programs written to the Win32 API to run on the Mac. Win32 is the 32-bit Windows API that debuts next month when Microsoft rolls out Windows NT.

In releasing the tools, Microsoft is making available commercial versions of tools it has been using internally. As much as 95 percent of the code is the same between Microsoft's Mac and Windows applications.

The company's Unix plans will provide a similar "run-time layer" that lets developers easily port Windows 32-bit applications to run on Unix versions by Sun Microsystems Inc., Hewlett-Packard Co., and IBM, Gates said. No ship date has been set for the Unix tools.

However, unlike the Mac im-

plementation, the Unix tools will not port code to have the look and feel of the platform's native graphical user interface, such as Sun's Open Look.

"We'll create the Windows appearance so that the documentation and training to use those applications doesn't have to be done over," Gates said.

Hints of Microsoft's effort to make Windows the dominant API standard on non-Intel PCs came to light last year when sources described the Mac tools.

Gates first began speaking publicly about the tools last month. (See "Blueprint for Windows 4 leaves DOS in the dust," March 15, page 1.)

Developers who want to take advantage of Mac System 7-specific features, such as Publish and Subscribe, will have to write additional code, as Microsoft did with Excel, Gates said.

Access makes inroads into corporations

clearly there are parts that are a little weaker, but everything we were concerned about they have addressed [in Version 1.1]," Baldridge said. Freightliner purchased 65 copies of Access at its \$99 promotional price.

Access 1.1 will also work with databases as large as 1 gigabyte and connect directly to FoxPro 2.0 and 2.5. Microsoft will include fixes to known bugs, such as the 31 currently posted on CompuServe, Engstrom said.

By year end, Access may include Rushmore, a FoxPro technology that could increase speed 10 times, according to Engstrom. In the coming weeks, Microsoft will finish its specification for adding replication technology.

Microsoft shipped 750,000 copies of Access. Although the \$99 promotion ended more than two months ago, dealers still have many copies of Access at the \$99 price. The regular price is \$495. Most CompUSA stores

still have the low-priced version, said Tom Weiland, corporate software buyer for the Dallas-based chain.

Approximately 80 percent of Access units shipped have been sold, with some 25 to 30 percent of that going to large accounts, Engstrom said.

Blue Cross/Blue Shield of Missouri also chose Access. The company ran into glitches running Access on a Hewlett-Packard Co. server but had better luck in stand-alone mode, said Lorenzo Squelini, manager of desktop computing services for the health care organization.

ChoiceCare, a health services firm in Cincinnati, also selected Access, buying 50 copies, said PC coordinator Gordon Summers. However, Summers is holding up the end-user rollout until Access 1.1 ships.

"We knew that there were bugs when we bought it, but we knew they would get fixed," Summers said.

APPLE / from page 1

Apple pushes enterprise with Oracle

relationships with big corporate IS directors that Apple needs." The kind of technical support demanded by large corporations will also be rolled out at the show. (See "Apple serves kick off broad enterprise push," March 22, page 8.)

Starting immediately, the Apple Assurance program will provide toll-free phone support seven days a week, on-line services for selected products, and a new support area on AppleLink. New service options on products purchased after February 1 will include a one-year warranty with an option for on-site per-

sonnel and mail-in service.

Apple will announce partnerships with seven more client/server tool vendors, including graphical interface builders from Blyth Software. Other tools in the areas of CASE, fourth-generation languages, and modeling and repository areas will be displayed.

"Apple is playing an inspired game of catch-up in client/server tools," said Mike West of the Gartner Group, in Santa Clara, Calif.

—Torsten Busse, Kelley Darnmore, and Doug Barney contributed to this article.

Product Spotlight

AST ships Grid Convertible-like pen notebook

AST Research Inc. shipped today the PenExec, its version of the Grid Convertible pen notebook. The 386SX-based system is available with a 120MB or 200MB hard drive and a battery designed to run for 24 to 3 hours.

Both the 120MB and 200MB hard drive versions ship with external floppy drives and a PCMCIA Type II slot. The \$2,895 120MB version comes with 2MB of RAM, expandable to 20MB. The \$3,295 200MB notebook ships with 4MB of RAM, also expandable to 20MB. The PenExec ships with limited versions of Slate Corp.'s Pen Essentials software and PenWare's PenCell spreadsheet.

AST of Irvine, Calif., is at (800) 876-4278.



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<i>IBM LAN Server</i>	*Token Ring (4/16 Mbps) *802.3
<i>AppleTalk</i>	*LocalTalk *EtherTalk
<i>HP-UX**</i>	*Ethernet
<i>SunOS**</i>	*Ethernet
<i>Solaris**</i>	*Ethernet
<i>SCO UNIX®</i>	*Ethernet

*Standard in the HP LaserJet 4Si MX printer. **For operating HP-UX, SunOS or Solaris, a one-time purchase of \$150 in configuration software is required. Adobe and PostScript are trademarks of Adobe Systems Inc. which may be registered in certain jurisdictions. Microsoft is a U.S. registered trademark of Microsoft Corporation. UNIX is a registered trademark of UNIX System Laboratories Inc. in the U.S.A. and other countries. In Canada call 1 800 387-3667, Ext. 7286. ©1993 Hewlett-Packard PE12253

Multiple environments are no longer worlds apart. Even if you have Novell Netware on one network, HP-UX on another and EtherTalk on a third, the new HP LaserJet 4Si MX printer easily connects across platforms. Automatically.

The HP LaserJet 4Si MX printer comes out-of-the-box preconfigured for multiple environments. There's nothing more to do than plug-and-play. All interfaces are simultaneously hot, making switching so seamless, end-users won't even notice.

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that adapts to multiple environments.



pike. More operating systems? No problem. As your network system continues to evolve, the capabilities of this printer are no longer just impressive. They're indispensable.

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But what if you don't need the full capabilities of the HP LaserJet 4Si MX printer right away? HP offers another printer that's probably a perfect fit. The HP LaserJet 4Si printer delivers the identical 17 ppm performance and superb 600 dpi print quality. It also has room to grow. The two MIO expansion slots let you add

HP JetDirect network interface or third party cards. And you can add on Adobe's genuine PostScript Level 2 software and SIMM memory modules, as you need them.

To find out more about the multiple-network HP LaserJet 4Si MX printer and the upgradeable HP LaserJet 4Si printer just call 1-800-LASERJET, Ext. 7299.† Capabilities this advanced make a world of difference—in any environment.



**HEWLETT
PACKARD**

Software industry should see boost in growth, IPOs this year

BY SHAWN WILLET

Networking software, application tools, and consumer-oriented programs will lead the software industry into a year of banner growth and record investment, according to market researchers and investment experts.

The increased flow of money from initial public offerings (IPOs) and venture

capital will mean more companies will diversify, start up new product lines, and acquire companies in the coming year, experts said.

A just-released report from Sentry Market Research, in Westborough, Mass., predicts the U.S. software industry will grow by 22 percent to \$41 billion in 1993, the highest rate of growth since 1986.

Driving the growth is the much-publi-

cized trend of downsizing to distributed systems, which requires a whole new set of software tools. Not surprisingly, client/server tools will be the big winners in the transition, with databases, system management products, and LAN administration tools following close behind, according to the report.

Packaged client/server applications, however, will not show explosive growth

for another 18 to 24 months.

The growth is making software companies popular vehicles for investors, who are eager to take risks in high tech because of low savings interest rates. The investment will initiate yet more rounds of growth in the software industry, analysts said.

Total venture capital placements in high-tech companies are expected to reach about \$2 billion in 1993, up from \$1.2 billion in 1992, according to Phil Black, a senior associate at Summit Partners, in Newport Beach, Calif.,

"The software industry has reached critical mass; people realize that it isn't going to collapse tomorrow," said Christopher Schember, a principal at investment and merger and acquisition consultants Broadview Associates, in Redwood City, Calif.

IPOs are also proliferating in the industry. Client/server tool vendors Powersoft Corp. and Gupta Corp. both went

Can you teach an old system new



tricks? Do your

client/server pieces fit? Are your

users testing your limits? Are

you at the end of your rope?



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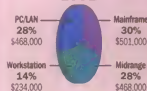
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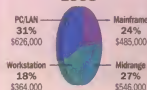
Perspective 93

Average packaged software expenditures per site*

1992



1993



*Survey taken from 1,500 large corporate/government sites. SOURCE: SENTRY MARKET RESEARCH

public recently. Powersoft's stock went from \$20 to \$31 as of last week, and Gupta's has risen from \$18 to \$24 since the initial offerings.

"Because of investors' problems with mainframe companies, they have gotten much more aware about the move to client/server," said Susan Schecter, investor relations representative for Powersoft.

For users, the freer-flowing capital will translate into new product launches and more acquisitions of other companies and technologies, according to investment experts.

But they also warn that the rosy investment picture in client/server, database, and networking software worlds does not necessarily make those companies stable.

Although client/server is a popular buzzword for investors, they have a shallow understanding of the technology shift, said several vendors and analysts. This could lead to disastrously rapid devaluation of stock, dried-up capital resources, and unstable product lines if a company doesn't live up to the high expectations. "There is a big difference between having a successful IPO and having a successful public company," Schember noted.

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PEOPLE

ANNOUNCED

Tios 3.2 adds six icons to Query window
TechKnowledge Inc. added icons to the Query window for Search, Clear Fields, Print, Fax, Notes, and Modify index in Tios 3.2 for Windows, the company's imaging product. (801) 261-8850.

SHIPPED

Claris sets price for ClarisWorks 2.0 Mac
Claris Corp. will not raise the price of ClarisWorks 2.0 for the Macintosh from the original version, which is \$299, and registered users can upgrade to 2.0 for \$99. A competitive upgrade is \$129. (408) 721-8227.

Corporate Checking from **Academe Systems Inc.**, a magnetic ink character recognition (MICR) check-writing, bank account management, and accounts-payable system, can print an entire check on a laser printer, including the MICR bank codes. Version MS supports MICR check printing for an unlimited number of accounts on a single PC for \$499, or for \$995 on a LAN. Version DS supports two MICR check printing accounts on a single PC for \$99 and on a two-account LAN for \$499 for each network. (800) 446-6619.

PROMOTIONS

Free upgrade set for Quicksoft PC-Write
Quicksoft Inc. said anyone who purchases PC-Write 4.0 before Version 4.1 ships — expected in the second quarter — will receive the upgrade at no additional cost. Version 4.1 is now in beta testing. Version 4.0 retails for \$89. (206) 282-0452.

Ventura Software Inc. has extended its Publisher's PowerPack promotion beyond March 31. Purchased separately, Ventura Publisher 4.1 for Windows, Ventura Publisher 4.0 for Windows, Ventura AdPro 1.1 for Windows, and Ventura Picture-Pro 1.1 for Windows would cost \$2,580. Ventura bundles them for \$995. (619) 673-0172.

UPGRADES

Word for Mac upgrade ships in April
Microsoft Inc. said its Word for Mac for the Mac 5.2, a line of document conversion utilities, will ship in April. The \$149 upgrade's translators take advantage of the Mac's Easy Open extension. (602) 271-0900.

Continued on page 16

NEWS / SOFTWARE

Stacker 3.1 turns up heat in data compression war

IBM, Novell consider bundles to counter Microsoft

By Ed Scannell

With last week's introduction of Stacker 3.1, Stac Electronics Inc. set the stage for a battle with Microsoft Corp. over data compression standards.

The latest version of Stacker uses the company's LZS technology, whereas Microsoft Corp.'s DOS 6.0, released last week, is bundled with the DoubleSpace data compression it licensed from VeriSoft Systems Inc.

With DOS 6.0 expected to sell in the millions, Microsoft appears to have a reasonable chance at shaping a data compression standard.

Stac, however, which claims to have 4 million users worldwide, may get some help from a couple of heavyweights.

Both IBM and Novell Inc. are weighing the possibility of incorporating Stac's data compression utility into their operat-

What else works with DOS 6.0?

Company	Product	Price	Availability
Addict	DoubleTools	\$99.95	Q2
ITD	XtraDrive 3.0	\$98	April
PC-Kwik	Power Pak 3.1	\$19.95*	mid-May
PC-Kwik	Super Power Pak 5.1	\$19.95	mid-May
Qualitas	386Max	\$99	June
Symantec	Norton Utilities 7.0	\$179**	Now
Symantec	Norton Backup 2.2	\$149***	Now
VeriSoft	SpaceManager	\$85.95	Now
VeriSoft	DoubleDisk Gold 6.0	\$99.95	Now

* Upgrade price for Power Pak 3.0 users; others, \$39.95.

** Suggested retail price: \$49 for registered users and \$59 with purchase of DOS 6.0.

*** Suggested retail price: \$39 for registered users and \$69 with purchase of DOS 6.0.

ing systems when they are available in the next several months.

Last year IBM's aggressively priced bundle, which included IBM DOS 5.0, Stacker 2.0, and Qualitas Inc.'s 386Max, sold well enough to make several Top 10 reseller lists. Big Blue is

expected to offer a similar bundling deal with IBM DOS 6.0, sources said.

Stac officials would not comment on whether they were actively pursuing a bundling deal for Novell DOS 7 but hinted at [See STACKER, page 20](#)

SQL Server for NT is in second beta

Microsoft on schedule for third-quarter release

By Stuart J. Johnston

Microsoft Corp. shipped last week the second beta copy of the 32-bit SQL Server for Windows NT. This week the company will ship a preliminary version of its SQL Server Client/Server Development Kit for NT.

Microsoft is on target for a third-quarter release of SQL Server for NT, the company said. SQL Server for NT will provide integrated support for symmetrical multiprocessing machines.

"We expect to have it on the market very quickly after NT [ships]," said Gary Voth, product manager for SQL Server.

The number of test sites will be expanded to 1,500 from the 600 sites in the first beta last November, Voth said.

The preliminary Software Development Kit (SDK), which will cost \$495, will contain a copy of the new SQL Server beta so developers can begin creating client/server applications before the final release.

Developers will need a copy of the final NT beta, which shipped last month and costs \$69, as well as compatible devel-

opment tools, Voth said.

When it ships in final form, SQL Server for Windows NT will be equivalent in features to the current Version 4.2 for OS/2. A later release will bring Microsoft's SQL Server in line with Sybase's current SQL Server, Version 10.

Purchasers of the SDK will

Integrated security, graphical performance monitoring included.

get a single-user copy of SQL Server for NT when the NT version ships, Voth said.

Voth did not give pricing for the unlimited version of SQL Server for NT.

Symmetrical multiprocessor support built into the product takes advantage of NT's capability to execute multiple threads across multiple processors, Voth added.

New features added in the second beta of SQL Server for NT include integrated security, a graphical performance monitoring capability, and a new database administration tool called SQL Object Manager.

The integrated security feature lets administrators choose to set up SQL Server's security in several ways, including allowing a single log-on to NT to permit access to SQL Server as well.

SQL Server now lets NT's performance monitoring tool follow many database services, including the number of users, the amount of CPU time per user, memory usage, and the number of locks per user.

SQL Object Manager provides a graphical editor that lets a database developer create, change, and delete database objects such as views, tables, triggers, and stored procedures.

The SDK requires the March NT beta release running on an Intel-based machine with 12MB of RAM (16MB recommended) and at least 30MB of free hard disk space.

Microsoft, located in Redmond, Wash., can be reached at (800) 227-4679.

Apple macro tool will tightly link programs

By Tom Quinlan

Integration between different applications grew a little tighter this week, as Apple Computer Inc. introduced its AppleScript supermacro language.

Originally revealed at last spring's Macintosh Systems Software Forum, AppleScript is designed to provide an operating system level of applications integration, said Laura Hamesley, Apple's product manager for component technologies.

"This is a long way away from the agents used in Knowledge Navigator," Hamesley said, "but it represents the next level of integration."

Apple's Knowledge Navigator is a videotape displaying a futuristic idea of how computing in the 21st century will take place, with computers actually making decisions through intelligent agents.

Using a language similar to HyperCard's HyperTalk, users can automatically open applications and move data between applications, between files, and over the network, Hamesley said.

Unlike Publish and Subscribe, which also links applications via AppleEvents, AppleScript will be more robust, with a full range of programming commands.

Users will need applications capable of being controlled by AppleScript, Hamesley said.

When the operating system enhancement ships this month, a handful of AppleScript-aware applications, including Excel 4.0, PageMaker 4.2, and Stuffit, are expected to be announced.

By Macworld in August, approximately 30 applications from vendors such as WordPerfect Corp., Lotus Development Corp., Microsoft Corp., and Claris Corp. are expected to be ready to ship, Hamesley said.

AppleScript eventually will be folded into the operating system, Hamesley said, but until then the version will be available for \$20, primarily for system integrators, software developers, and corporate programmers.

A run-time version will be available for System 7.0 and 7.1 users over a bulletin board.

Apple also intends to make the scripting language available on other forms, but Hamesley did not give a date.

"We're still evaluating how QuickTime for Windows is doing," Hamesley said. "That's the first cross-platform software we've developed, and we're still studying the marketing issues."

PIPELINE from page 15

ANNOUNCED

**SpreadBase release
object for this month**

Objective Software Inc. will release its SpreadBase 1.1 for the Macintosh this month and is developing a Windows version that the company plans to release in late 1993. New features in Version 1.1 will include direct relational database access via Brio Technology Inc.'s DataPalm and support for Apple Computer Inc.'s Data Access Manager. SpreadBase will retail for \$695. (415) 306-7470.

Frame Technology Corp. and Verity Inc. have called off their proposed merger. Instead, Frame will take a \$2.2 million equity investment in Verity and the two will pursue "joint marketing and consulting arrangements," according to Paul Robichaux, Frame chairman. Frame Technology makes document publishing software and Verity publishes document retrieval software.

PROMOTIONS

**Claris lowers prices
for Windows apps**

From April 1 through August 15, FileMaker Pro 2.0 for Windows, Claris Corp.'s database manager, will be offered for \$129 — a \$250 savings. ClarisWorks 1.0 for Windows, an integrated software package set to ship by May, will be offered at an introductory price of \$99; after August 15, it will be offered for \$249. (408) 987-7000.

SHIPPED

**Express Publisher has
design, layout advice**

Power Up Software Corp.'s Express Publisher 3.0 for DOS now includes on-line design and layout advice. Version 3.0 also has enhanced print performance and more graphic options. It has an introductory price of \$99.95 through June 30, with a suggested retail price thereafter of \$124.95. (415) 345-5900.

Accounting software users who want to print their forms directly onto plain paper using laser printers, rather than purchasing preprinted forms, can do so with **Graphics Development International's** \$79.95 FlashForm. (415) 382-6600.

TerraNets Inc.'s SafeDeposit, an automated backup application for Macintoshes, is available at a four-month introductory price of \$99; the price will then rise to \$189. (801) 269-7394.

PerfectKeys, an add-in for WordPerfect for DOS 5.x from **Jase Inc.**, halves editing time through extensive single-keystroke command shortcuts and styles. It costs \$79. (612) 930-9171.

Users complain clones running OS/2 are 'flaky'

BY ED SCANNELL

As more end-user sites are buying generic clones, complaints about OS/2 2.0 not running well — or at all — on these machines continue to grow.

Sometimes priced hundreds of dollars less than even the most price-competitive brand-name machines, small-job shops will push out almost 2 million units this year, according to estimates by InfoCorp. Inc., in Santa Clara, Calif.

Although the vast majority of these systems have no difficulty running DOS and Windows, many users either cannot install OS/2 or, once they do, experi-

ence "flaky" performance, according to several users.

"I think this is a very real problem, and OS/2 may be suffering unnecessarily," said one user who requested anonymity. "Windows and DOS seem to have no problems on these machines."

IBM is aware of the difficulties. Officials recently admitted that most of the installation and technical complaints about OS/2 are from generic clone users.

But what bothers some of these users is that IBM is not responsive enough to their problems because the company discounts their importance.

"We have told IBM that if

they intend to be mass market with OS/2 and not just corporate, they have to address this," said Brian Mauro, assistant city manager for San Carlos, Calif.

IBM has been addressing the problem with generic systems since OS/2 2.0 was in beta, said an IBM representative. IBM said it offers a money-back guarantee to users who are unable to use the product, he added.

"We remain absolutely serious about [OS/2] running on every PC," said Rob Crawley, an IBM representative. "But with the number of variations we face, it takes some time to run them all down."

As of January, IBM's Boca

Raton, Fla., testing facility has certified a little more than 500 machines to run with OS/2, Crawley said.

Some users of generic clones say their problems with OS/2 sometimes generate ill feeling between them and the job shop where they bought the machine. Job-shop owners often point to the hundreds of systems they have sold that worked well with Windows and DOS, according to some users.

These owners say they have lost money on sales to some users who ask to have several motherboards swapped in and out until they find one that works with OS/2.

COP helps police return computers

ID software and database tracks lost or stolen PCs

BY YVONNE LEE

A Long Island, N.Y., company recently released identification software for the Macintosh and a database system for tracking lost or stolen computers.

Computer Owner Protection (COP) for the Macintosh, from ID Tech Technologies Inc., gives each system a unique identification code and records that encrypted code at various locations around the hard drive. "We developed the software at the request of police in New Jersey and New York," said Warner Loe, ID Tech Technologies chairman.

"They felt that the coming problem would be computer theft," Loe said. "[Computers are] very portable, have a high

resale probability, and the only identification was a sticker, which is easily removable with nothing more than a fingernail. [The police] asked us to do something more permanent and more dependable."

The company has been shipping identification and retrieval DOS software since 1990. Its newest product provides that same service for the Macintosh. Although COP for Mac will work with any Mac running System 7, it is specifically aimed at the popular PowerBook notebooks.

Users install the software on their Macintosh, complete some electronic forms with information about the computer, and then return a registration diskette to ID Tech Technologies.

Once a lost or stolen computer is retrieved, police can activate the software and learn where to return the computer.

ID Tech Technologies is working with lost and found departments at airports to use the service as well, Loe said.

The Macintosh identification software will recite the computer's registration number through the Mac speaker.

Users who recover a missing machine with an 800 number, where a central computer interprets tones from the DOS version.

COP for Macintosh began shipping this month for \$49.

ID Tech Technologies, in Secaucus, N.Y., can be reached at (800) 654-5404.



Instant access to applications is a yell away

BY CATE CORCORAN

Windows users with sound cards can add continuous-speech voice commands to their PCs and literally call up the applications they use most often.

Command Corp.'s IN Voice Command lets users instantly bring an application to the foreground by saying its name, rather than shuffling through windows with a mouse, the company said.

IN can also execute multiple keyboard commands or mouse clicks with one word — a feature that is especially useful for command-intensive applications such as CAD/CAM, publishing, and databases, Command said.

Because the \$179 IN Voice Command is based on continuous-speech technology, it can recognize even quickly spoken words. The program's response is instant, according to the company, which recommends at least a 25-MHz 386 system.

The software ships with a "starter lexicon" of generic commands. Users can record their own commands for Windows-compatible applications. It works with any Windows-compatible sound card or built-in audio.

Command, in Duluth, Ga., is at (404) 925-7950.

Tool ports Windows applications to Unix

BY ED SCANNELL

Offering Windows developers new horizons to chase, Bristol Technology Inc. introduced a technology that lets them quickly convert applications to run under Unix.

Called **Wind/U**, the technology gives developers entry to the Unix marketplace with a simple recompile of their Windows applications, company executives claim.

The recompiled application then works with Unix under the Open Software Foundation's Motif graphical interface.

The new tool can also represent a major cost savings to developers — particularly smaller ones — who want to get into the Unix market while they continue developing Windows applications to generate another revenue stream.

"Developers can continue to focus their primary programming efforts on the popular Windows API and still be assured their applications are

Wind/U maintains identical functionality between the Windows and Unix versions.

functionally identical under Windows and Unix," said Keith Blackwell, cofounder of Bristol Technology.

Microsoft Corp. and several

market researchers believe the number of Windows-compatible applications is now approaching 10,000.

Applications are actually recompiled in the Unix environment and then linked to the Wind/U Library, a company representative explained. This is what allows the Windows application to work natively under Unix.

All Windows applications ported with Wind/U maintain identical functionality between the Windows and Unix versions, including features such as on-line help, PostScript and PCL printing boxes, and multiple document interfaces.

The price for a Wind/U developers' license, available now, is \$9,950.

Bristol Technology, in Ridgefield, Conn., can be reached at (203) 438-6969.

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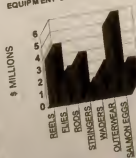


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The Microsoft Office for Windows includes the complete editions of Microsoft Excel, Word, PowerPoint and a Microsoft Mail workstation license.

Microsoft
Making it easier

Dell to offer Solaris on its high-end CPUs

By STEVE POULI

Solaris, SunSoft Inc.'s 32-bit Unix variant, will be available on Dell Computer Corp. high-end systems later this year.

However, Solaris will probably not be offered as ReadyWare, Dell's program of pre-loading software before systems are shipped to customers, according to Charles Sauer, Dell vice president of software and technology.

Sauer said Solaris is much more complex than DOS and many details of the forthcoming release for Intel-based systems have yet to be finalized before the operating system's release in May.

Details of Dell support for Solaris will be disclosed when Solaris is released, Sauer said.

Solaris is considered one of the premier Unix implementations in the workstation market. Early copies of the Intel version look pretty promising, Sauer said. Solaris supports networking, multitasking, and multi-threading.

Dell will also consider what, if any, Solaris-compatible applications will be offered by the Austin, Texas, computer maker when the operating system hits the market.

"We're still sorting through those issues," Sauer said. "We'll do what our customers want, but it may very well be that customers who need Solaris are involved in downsizing applications. In those situations, they may be using applications developed in-house."

SunSoft is based in Mountain View, Calif., and can be reached at (415) 960-3200.

STACKER / from page 15

Turns up heat in compression war

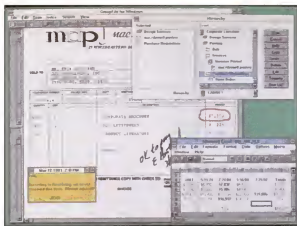
the prospects.

"If you think about the possibilities in a networked environment, such a match could be very dynamic," said Anne Galdos, product marketing manager for Stackcr 3.1.

However, Galdos admits that Microsoft's decision to include data compression in the operating system can only help legitimize the technology.

"Microsoft's validation of data compression lets us show that we have a better product," Galdos said. "It also lets us concentrate more on our product and not do as much missionary work."

Stack can show its superiority through hooks built in DOS 6.0 that let programs such as Stackcr 3.1 integrate seamlessly into



Users can customize GroupFile for Windows to meet specific needs in managing documents.

GroupFile will manage documents on network

By DOUG BARNEY

A Windows-based document management system, GroupFile for Windows, was announced last week by LaserData Inc.

The network-compatible package can handle an array of data types, including spreadsheets, databases, graphics, scanned images, and word processing documents. These documents can be displayed, manipulated, and captured.

Documents are organized and stored using a system of drawers, folders, and cabinets. These items are searched and retrieved through standard database applications that are bundled with the package.

The stand-alone version of GroupFile for Windows comes with Borland International Inc.'s Paradox for Windows, and the network version uses Microsoft Corp.'s SQL Server. The firm plans to support all Open Database Connectivity-

compatible products.

Users can retrieve documents by date, keyword, or document name, or through Boolean logic. IS managers can establish access controls to these documents and restrict the user's ability to set up new folders.

With GroupFile, annotations can be added to documents and represented as icons. Important information can also be highlighted in as many as 16 different colors.

The system can be linked to LaserData's more sophisticated document services, including storage on write-once read-many (WORM) drives.

The product will ship in May and sells for \$499 for a stand-alone Microsoft Windows version. The network version starts at \$8,990 and serves five users. The Network Edition is Novell NetWare compatible and uses an IBM OS/2 server.

LaserData, in Tyngsboro, Mass., is at (508) 649-4600.

to remember two sets of commands. It also eliminates users' diverse readings of available space on a stacked drive when using the CHKDSK and CHECK commands.

Files stacked with Stackcr 3.1, however, are not compatible with the data compression product used in DOS 6.0 because Microsoft is not shipping a conversion program.

Microsoft is reportedly working on such a utility but has not announced a ship date.

Stackcr 3.1 will not be available for at least 30 days after the delivery of DOS 6.0. The program is priced at \$149 and will be sold through resellers.

An upgrade for users of Stackcr 3.0 for DOS and Windows will also be available in the next 30 to 60 days for \$19.95.

Users who purchased Stackcr 3.0 after March 30 can upgrade free with proof of purchase.

Microsoft is a hit win in workgroups

Despite vague strategy, tool set approach appeals to developers

By DOUG BARNEY

While competitors openly clash at Microsoft Corp.'s sparsely defined workgroup strategy, interviews with VARs and corporations reveal that Microsoft tools are being used to build full-fledged group applications.

"The tools are there from Microsoft for an integrator to develop some pretty state-of-the-art workgroup applications," said Len Gavin, staff network consultant for Integris, an enterprise integration firm based in Phoenix. Gavin has used Microsoft tools to build a workflow-oriented imaging system that uses Microsoft Access as a front-end database.

The tools, which shipped last month, are Workgroup Extensions to workgroup-enable Microsoft applications, specifically Project, Excel, and Word.

Microsoft has been pushing an amalgam of Visual Basic, Windows for Workgroups, Ac-

cess replication features, Liskak said. This will be addressed "shortly," Microsoft said.

One VAR claims to have already cracked the replication bottleneck. "Using Microsoft tools, you can build replication services without a great deal of difficulty," said Paul Guarnaldi, vice president of sales with Vainor Inc., a Manchester, N.H.-based VAR and systems integrator.

Guarnaldi said his firm has built a replication system that tracks records, determines which are new, replicates them using stored procedures in SQL Server, and distributes them via MAPI.

Travel agent Rosen Bluth International Inc., in Philadelphia, has created a workgroup system for travel reservations using Microsoft tools. Clients can use standard E-mail systems, including MCI Mail, to make requests that are passed to an agent, who sends back an itinerary. The firm chose Microsoft because

This building-block approach differs radically from Lotus Development Corp.'s approach with Notes, widely viewed as an all-in-one solution.

cess and FoxPro, and application programming interfaces such as the Mail Applications Programming Interface (MAPI) as the foundation of workgroup applications. This building-block approach differs radically from Lotus Development Corp.'s approach with Notes, widely viewed as an all-in-one solution.

Although Notes is compelling for many customers because the tools are packaged together, others prefer Microsoft's tool set approach.

"Notes is a specific application, a shared database," said Jim Liskak, programmer/analyst for Chevron Information Technology Co., in San Ramon, Calif. "But workgroup computing is the ability to take applications and share the resources of multiple users over a net."

Liskak has been using Visual Basic and Microsoft Mail to build workgroup applications that provide scheduling, calendaring, and workflow automation.

The only drawback is Microsoft's lack of sophisticated data-

"Notes was too expensive," said Joe Ruggiero, project manager for the agency.

The application toolkits, Workgroup Extensions for Excel, Word, and Project, are available free on CompuServe. They include extensions to the macro language, called MAPI, greater integration with Microsoft Schedule+, and sample code.

"All of this is driven through macros," said Shane Kim, Microsoft product manager in the workgroup division.

With the MAPI and networking macro extensions, users can log onto mail, send and return mail, manage attachments, and tie into mail's directory services.

There are four main components of workgroup computing: routing, tracking, discussing and referencing, and collaboration, according to Kim. Kim gives the nod to Notes only in the area of discussing and referencing.

"Our approach says that the OS is the best platform," Kim said. "You can use different development tools and use applications from any vendor."



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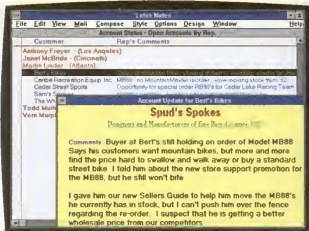
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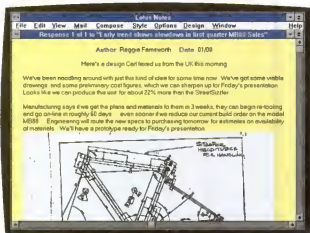
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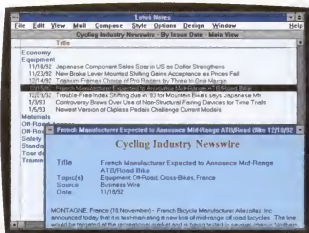
1. This is Michelle's Notes desktop. Each icon represents a different Notes application. She uses these to work with people all over the world including the field sales team, manufacturing, engineering, R&D, key customers and senior management. She regularly scans activities in the field by double clicking on ACCOUNT STATUS.



2. Today, she notices a number of entries regarding a slow-down in closing first quarter reorders for their most popular model, the MountainMaster off-road bike. It seems the market for this high-price bike is beginning to dry up. This could be a major problem.



5. The next morning she checks into the DISCUSSION database and this time finds an entry from Reggie in R&D. Reggie had also read Jim's message and is responding with a possible solution his people have been playing with. He pastes in an autoclipped illustration faxed to him from the U.K. using a Notes incoming fax gateway.



6. With a presentation on Friday, Michelle gets down to some quick market research by opening up the CYCLING INDUSTRY NEWS database. An organized source of live industry data, it provides a news report on a French company that has a couple months head start developing a hybrid bike.

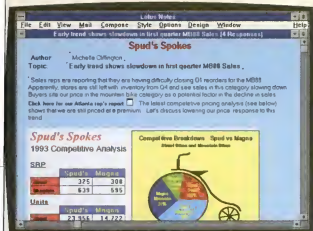
To see how fast you Lotus Notes, just wat

What would you do if you suddenly found out that your key product was in trouble? Could your organization react quickly and effectively?

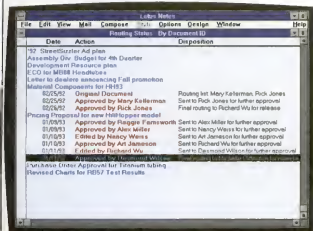
We've chosen this as an ideal situation to demonstrate the power of Lotus Notes®. See how Notes improves business performance by accelerating processes and helping people work together more effectively.



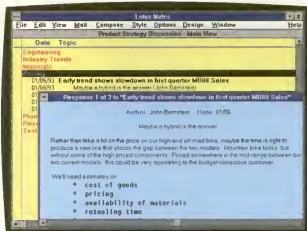
Michelle Clifflington is a product manager for a bicycle manufacturer. She's responsible for all product planning, market research and marketing activities for her product line. Notes helps her shift gears and rush a new product to market. See how she accesses, tracks, shares and organizes information in ways never before possible. How



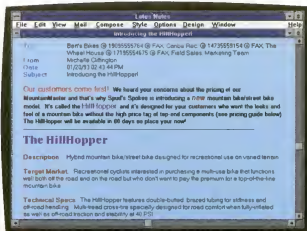
3. She decides to recommend a price-reduction and double clicks into the **STRATEGIC PRODUCT DISCUSSION** database. This provides an organization-wide forum to discuss issues and brainstorm solutions. She links the report from the Atlanta rep directly into her Notes document. Then she uses DDE to embed some 1-2-3® charts into her document as well.



4. Later in the day she re-enters the **DISCUSSION** database looking for responses. Her boss, John, has logged on from his hotel room in San Francisco. Rather than cut the margin, he suggests she explore the feasibility of adding a mid-priced bike to their line. He wants an initial presentation for Friday.



5. A few days after routing her proposal to the product team, she wants to find out where it stands within the organization. She opens the **ROUTING STATUS** application to find that it has worked its way through the organization to Desmond, the senior decision-maker, and has been finally approved. So she's on her way.



6. Michelle closes the loop by communicating the news to their customers. Double clicking into the **CUSTOMER FEEDBACK** database, she faxes a memo directly from Notes to all retailers. In it she explains that the company has heard their problems and responded with the Hill Hopper. And with delivery in 80 days, they can order now.



can respond with michelle shift gears.

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Window Manager / Brian Livingston

Redefine your own undocumented Word key combinations



Windows 3.1 introduced a handy feature called "local reboot." This means that when you press Ctrl-Alt-Delete in Windows Enhanced Mode, your PC does not immediately restart. Instead, Windows displays a text box that gives you a choice of returning to Windows, terminating a hung application (if one is in that state), or really rebooting. (If you don't like this feature and want Ctrl-Alt-Delete to reboot your PC immediately, you can put the line `LocalReboot=OFF` in the [386Enh] section of SYSTEM.INI.)

Local reboot means it is no longer risky for us to place keyboard macros on Ctrl-Alt key combinations. If a user accidentally hits the Delete key while holding down Ctrl and Alt, Windows' text screen appears and the user can continue working, if desired.

For this reason, I was surprised when Microsoft Word for Windows 2.0 and WordPerfect 5.2 for Windows came out. These applications allow you to assign macros to certain key combinations—but not to any combination that includes Alt, Ctrl-Alt, or Shift-Alt!

It's particularly important for us to be able to redefine Ctrl-Alt key combinations because almost every key combination involving Ctrl-Shift and Shift-Alt is already being used by one application or another. So let me make clear to software vendors Livingston's Law of User Customizability: *Leave all Ctrl-Alt combinations for the user to redefine!*

Having said that, I'd like to give you a way to place macros on any key combination in Word for Windows—even undocumented key combinations. (We'll look at WordPerfect next week.)

In Word for Windows 2.0, click Tools Record-Macro. Type in the name AutoAssignToKey and click OK. Assign the macro to the Global level when asked. Without pressing any other keys, click Tools Stop-Recorder. You've just recorded the shortest possible macro.

Now click Tools Macro, select AutoAssignToKey, and click Edit. You should see a macro editing window containing only two lines: Sub MAIN and End Sub. Type between these lines the contents of the AutoAssignToKey macro shown in the accompanying box. Once your window looks the same as this macro, click File Close and save the changes when asked.

Now you can assign any Word for Windows macro to any key combination—even ones not permitted by the program's Tools Options Keyboard dialog box.

Let's start by assigning the AutoAssignToKey macro itself to a key combination, so it's easily accessible when you need it.

Click on Tools Macro, then select AutoAssignToKey, and click Run. You

notions. (One time I accidentally redefined the Alt key itself, and boy, does that make it hard to use Word for Windows!)

To find the key codes for any particular key, use the accompanying Key Codes chart. To assign a key with Ctrl held down, add 256 to the number shown. Add 512 for Shift, and 1024 for Alt. These values can be added together to indicate more than one modifier key. The

key is another oddity. Along with Pause, this is a great key to define, because it has no function in Word for Windows or most other programs. But sometimes the Scroll Lock key acts as if it has a value of 145 and at other times (specifically, when the Ctrl key is involved in the combination) a value of 31! The Pause key can't be redefined with Ctrl involved at all. Test these keys carefully when you assign them.

Additionally, according to the *Hacker's Guide*, many combinations involving the numeric keypad and directional-arrows keypad do not work well. The authors tested every single combination—an other example of the extensive research that went into this book. It seems the numeric keypad doesn't like to be reassigned with the Shift key involved, nor the arrow keypad unless Alt is involved. Check the book.

Be aware that Windows pre-empted Ctrl-Alt-Delete and key combinations involving Ctrl-Escape.

Finally, you should know that Windows forces Alt-F1 and Alt-F2 to mean the same thing as F11 and F12, in case you're still using a keyboard with only 10 function keys.

Armed with this knowledge, you should now have plenty of macro keys.

Figure 1: AutoAssignToKey macro

```
Sub MAIN
On Error Goto BTE
name$ = InputBox("Type the macro name to assign to a key")
num$ = InputBox("Type the key number from Using WordBasic")
num = Val(num$)
If num < 8 Or num > 2014 Then
MsgBox "Number of the key must be 8 to 2014."
Else
ToolsOptionsKeyboard.Name = name$, .KeyCode = num, .Context = 0
End If
BTE:
End Sub
```

Figure 2: AutoUnassignToKey Macro

```
Sub MAIN
On Error Goto BTE
num$ = InputBox("Type the key number to unassign from Using WordBasic")
num = Val(num$)
If num < 8 Or num > 2014 Then
MsgBox "Number of the key must be 8 to 2014."
Else
ToolsOptionsKeyboard.KeyCode = num, .Context = 0, .Delete
ToolsOptionsKeyboard.KeyCode = num, .Context = 0, .Delete
BTE:
End Sub
```

should see a dialog box that asks you for a macro name to assign. Type in the name AutoAssignToKey. Click OK, and you should see another dialog box, this one asking you for a key number. Type 1288 to assign it to Ctrl-Alt-Backspace and click OK.

After the dialog box closes, try out your new key definition. Press Ctrl-Alt-Backspace, and the AutoAssignToKey dialog box should appear, ready for you to define any other key definitions you like.

Use the same method, type in the AutoUnassignToKey macro, so it's ready when you need to undo any key redefi-

Backspace key, for example, has a key code of 8, so Ctrl-Alt-Backspace is 1288 because 256 + 1024 + 8 = 1288.

Most of these codes are listed in *Using WordBasic*, Microsoft Corp.'s latest attempt to document the WordBasic language—but not all. Each of the keys from Pause to Apostrophe are undocumented by Microsoft, although I've written about them since 1991. And, as Woody Leonard and Vincent Chen point out in *The Hacker's Guide to Word for Windows* (Addison-Wesley, \$39.95, [800] 822-6339), not all the combinations that are documented actually work.

Due to bugs, some combinations simply do not function as expected.

Using WordBasic states that Numeric Keycode 5—with Num Lock off—when ordinarily does nothing—can be redefined by specifying key code 12. But this does not work unless you specify a Ctrl or Alt key in conjunction with Keycode 5. For example, Shift-Alt-Keycode 5 can be assigned to a macro successfully, but Keycode 5 and Shift-Keycode 5 cannot.

The Scroll Lock

ADD-ONS AND FIXES. I mentioned March 22—the *Using WordBasic Under Windows* feature can delete every paragraph in which even a single character has produced. I left out a step required to rechange that problem. You must first use the Compare Documents feature to create a document that has revisions marked. But it's better to avoid Word's limitations entirely by using DocuComp, a product that marks specific changes from one document to the next, instead of just flagging whole paragraphs. (Advanced Software Inc., \$199.95, [800] 346-5392 or [408] 733-0745.)

Another problem is embedded graphics. Word converts each graphic into a metafile, with enormous overhead. Inserting a 146KB bit map into one page of text resulted in a 1.326KB document on my disk. This is corrected by Quicure, a product shipping this month, which inserts placeholders into documents and compresses the bit maps, saving tremendous amounts of space. (WexTech Systems Inc., \$39, [212] 949-5595, Ext. 1.)

Difficulties opening or saving files in non-Word formats can be overcome using Word for Word, from the people who produced some of the original file filters for Microsoft.

The Word add-in version is \$79.95 and supports some 50 formats. The stand-alone application (which can batch-convert Diffiles \$14.99 or supports files in 100 formats, [Mastersoft Inc., [800] 624-6107 or [602] 277-0900.)

Finally, the best all-around add-in is probably MasterWord, with more than 500 customizable color toolbar buttons and the best File Open and File New dialog boxes I've seen. (Aiki Software Corp., \$59.95 [on sale, [800] 669-9673].)

Brian Livingston is a speaker at Windows seminars. His new book is *Windows Gizmos (IDG Books)*. Send tips to: *Compuserve 70053.53*; *MC 420-0583*; *Internet 420-0583* at *mcimail.com*; or *fax: (206) 282-1248*.

Word for Windows Key Codes

Bksp.	8	5	53	i	76	F1†	112	Keypad 0	96	Keypad 5	12
Tab	9	6	54	m	77	F2†	113	Keypad 1	97	(Num Lock off)	12
Enter	13	7	55	n	78	F3	114	Keypad 2	98	Pause	19
Esc	27	8	56	o	79	F4	115	Keypad 3	99	Scroll Lock 3 or 145	19
Space	57	9	57	p	80	F5	116	Keypad 4	100	(semicolon)	186
PgUp	33	a	65	q	81	F6	117	Keypad 5	101	(= equals sign)	187
PgDn	34	b	66	r	82	F7	118	Keypad 6	102	(comma)	188
End	35	c	67	s	83	F8	119	Keypad 7	103	(hyphen)	189
Home	36	d	68	t	84	F9	120	Keypad 8	104	(period)	190
Ins	45	e	69	u	85	F10	121	Keypad 9	105	(/ slash)	191
Del	46	f	70	v	86	F11†	122	Keypad *	106	(backquote)	192
0	48	g	71	w	87	F12†	123	Keypad +	107	(left bracket)	219
1	49	h	72	x	88	F13	124	Keypad .	108	(backslash)	220
2	50	i	73	y	89	F14	125	Keypad -	109	(right bracket)	221
3	51	j	74	z	90	F15	126	Keypad _	110	(apostrophe)	222
4	52	k	75			F16	127	Keypad /	111		

† Windows Forces Alt-F1 and Alt-F2 to have the same meaning as F11 and F12.

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NEWS/HARDWARE

PIPELINE

PRICE CUTS

Lexmark cuts printer prices by up to \$400
Price cuts of between \$70 and \$400 were made by Lexmark International Inc. last week that affected virtually all of the company's IBM printer lines. A mid-range IBM LaserPrinter 10L is now priced at \$1,899, compared with a previous price of \$2,299. (606) 232-4754.

ANNOUNCED

Instant rebate being offered by Sigma
Sigma Designs Inc. is offering users between \$25 and \$50 off selected graphics and sound boards. The rebate is part of Sigma's Sight and Sound promotion and affects its 24-bit color WinStorm graphics accelerator card and the WinSound 16 16-bit sound card. Suggested prices for the products, before rebate, are \$429 and \$299, respectively. (800) 845-8086.

Travelling Software Inc. announced last week that it had sold Battery Watch Pro 4.0 to notebook BIOS vendor Phoenix Technologies Ltd. Phoenix will continue to offer the software to end-users but will focus on selling it with other products as part of its OEM offering.

Technology Works Inc. announced last week it would bundle Connectix PowerBook Utilities with memory modules for PowerBook and PowerBook Duo notebooks. (800) 688-7466.

PowerBook users can get an upgraded numeric keypad from Kensington Microware Ltd. Notebook KeyPad now comes with an ADB pass-through, which lets users add devices such as ADB modems, trackballs, and external keyboards. The updated \$149.95 keypad will also include adding machine software. A hardware-only version costs \$119.95. (800) 535-4242.

SHIPPING

Nisca introduces a portable 8-bit scanner
Nisca Inc. has introduced a portable, gray-scale, hand-held scanner called Niscan Page. The sheet-fed 8-bit scanner can connect to an IBM-compatible PC or notebook and offers 400-dpi-per-inch resolution. Priced at \$799, the device is powered by an AC battery and plugs into the PC's front panel parallel port. Oron Inc.'s Word Perfect software package is bundled with the device. (214) 242-9696.

Compress a video minute into 9MB

BY TOM QUINLAN

Intel Corp. fulfilled a months-old promise last week by delivering a low-cost video capture and compression board, with hopes that the board could stir some interest in multimedia among corporate users.

The board itself is still based on Intel's i750 processor, but unlike other Digital Video Interactive boards on the market—costing hundreds to thousands of dollars more—it does not accelerate video playback.

"We asked users what they needed most to make multimedia real for them, and this is

what they said they needed," said Claude Leglise, Intel video brand marketing director.

What users apparently told Intel they needed was a \$699 board that could compress and store Indeo files on the fly.

Unlike two-step capture and compression boards that initially require large amounts of hard disk space—an estimated 30MB for 1 minute of uncompressed video—Intel's Smart Video Recorder stores a minute of compressed video in a 9MB file.

The video is then played back at a speed and size best supported by the processor.

Unlike other new technologies that require new suites of software to become established, the big drawback to establishing multimedia in the corporate world has been the expensive and cumbersome hardware add-ons needed to make multimedia a reality.

"To this point, it's fair to say that multimedia has been a consumer market," Leglise said. "But that's because the hardware products that businesses need have not been available."

"With OLE, the software is already there because users can add video to their spreadsheets, databases, and word proces-

sors," Leglise added. "They do not need a whole new set of applications."

OLE, or Object Linking and Embedding, is one way that Microsoft Corp.'s Video for Windows lets users play back video files in standard applications, even if those users don't have Video For Windows on their systems.

Intel also enhanced its Indeo software compression technology last week so that the software will support a 320-by-240 video window.

Intel, in Santa Clara, Calif., can be reached at (800) 458-4725.

'Captain Crunch' plays back video at 30 frames per second

BY KELLEY DAMORE

Media Vision Inc. introduced last week a video compression technology that could be a stimulus to bring more multimedia tools and hardware boards to mainstream business markets.

Called Captain Crunch, the technology offers real-time compression and decompression of captured video in a 320-by-240 window at 30 frames per second (fps).

To date, compression algorithms found in Apple Computer Inc.'s QuickTime and Mi-

crosoft Corp.'s Video for Windows offer playback rates of 15 fps in a 160-by-120 window.

The Captain Crunch technology can be used on both 386-based PCs and Apple's 68030-based Macintoshes.

It is scalable, meaning that the performance is determined by the system's processor, according to Media Vision officials.

"The [multimedia] market has been floundering," said Satish Gupta, vice president of marketing. "The reason it has not caught on is because of hardware prices and the quality of

the video. By offering 160 by 120 at 15 frames per second, the quality is marginal," Gupta said.

Analysts agreed that this technology has the potential to bring multimedia to the masses.

Media Vision will offer the technology to software vendors, such as Microsoft and IBM, and Unix vendors. It is likely that Microsoft would license it for its next version of Video for Windows, sources said.

Media Vision will also be licensing this algorithm to vendors and tool developers such as Macromedia Inc.

Captain Crunch is expected to be available in the second quarter of this year.

In addition, the company will release a \$50 chip set later this year for hardware developers. This chip set would cut the cost of video capture and compression boards in half—giving users add-in cards for less than \$300 by the end of the year.

Presently, video capture and compression boards are priced from \$700 to \$900.

Media Vision, in Fremont, Calif., can be reached at (510) 770-8600.

HP readies two 17-ppm, 600-dpi LaserJet printers

BY KELLEY DAMORE

Hoping for a grand slam in network printing, Hewlett-Packard Co. will introduce this week two 17-page-per-minute (ppm) printers this week.

The LaserJet 4Si and LaserJet 4Si MX printers offer 600-dpi-per-inch (dpi) resolution and can connect directly to PCs, Macintoshes, and Unix-based workstations concurrently.

The LaserJet 4Si replaces the LaserJet IIiX and IIISi. It offers enhanced PCL5, 2MB of memory, a BiTronics parallel interface, and two modular I/O slots.

The LaserJet 4Si MX includes enhanced PCL5, Adobe PostScript Level 2, 10MB of memory, a BiTronics parallel interface, a LocalTalk interface, and a JetDirect Ethernet interface.

Those interfaces automatically switch among 10 network operating systems, including Novell Inc.'s NetWare; Microsoft

Corp.'s Windows for Workgroups, Windows NT, and LAN Manager; IBM LAN Server; EtherTalk; HP-UX; Sun Microsystems Inc.'s SunOS and Solaris; and The Santa Cruz Operation Inc.'s Unix.

HP has further enhanced the networking capabilities for NetWare users to include bidirectional communication, multiple queue support, printer configuration, and security tools.

The modular I/O second slot will also enable users to plug in a GDI Print System or PostScript fax card, enhancing their printing capability, analysts said.

"The two [modular I/O] slots give the LaserJet 4Si more network flexibility and has solved some of the interoperability problem, since all of the communication protocols are on a single board," said Michael Weiss, president of MWA Consulting Inc., in Mountain View, Calif.



Two network printers from HP offer users 17-ppm performance, 600-dpi resolution, and PCL5 and PostScript level 2 support.

According to BIS Strategic Decisions Inc., in Norwell, Mass., HP had 50 percent of the 12- to 19-ppm market in 1992.

The LaserJet 4Si is priced at \$3,749, and the MX version is

\$5,499. Both come standard with two 500-sheet input trays, a front-panel lock-out feature, and a 75,000-ppm duty cycle.

HP, in Palo Alto, Calif., can be reached at (800) 752-0900.

DEC unveils workgroup, color dot-matrix printers

BY KELLEY DAMORE

Digital Equipment Corp. recently introduced two printers with technologies that span the spectrum of the printer market.

For workgroup computing, DEC unveiled the PrintServer 17, a 17-page-per-minute printer based on a VAX 4000 chip. The printer enables a user on IBM's AIX; Hewlett-Packard Co.'s UX; and The Santa Cruz Operation's Unix, SunOS, DEC OSF/1, Ultrix, and OpenVMS environments. It can be connected to DECNet and TCP/IP networks and can accept the jobs concurrently.

The PrintServer software bundled with the printer offers accounting features such as two-way communication of printer and job status, output tray selection, simplex and duplex printing options, and ASCII and PostScript selection. The 300-dot-per-inch (dpi) machine also provides

error recovery, according to the Maynard, Mass.-based company.

"DEC has a rich host-based network printing strategy," said Barbara Ellis, senior consultant for MWA Consulting, a market research firm based in Palo Alto, Calif. "It doesn't have PostScript Level 2 or 600-dpi, however. While users may not be clamoring about it now, DEC has got

to add it to their product."

Priced at \$5,995, the printer comes standard with 8MB of memory, a 50,000-page duty cycle, two 500-sheet input paper trays and a Thick Wire/Thin Wire Ethernet interface.

On the low end, DEC also announced a color dot-matrix printer. The DEC-Writer is a 360-dpi, 24-wire narrow car-

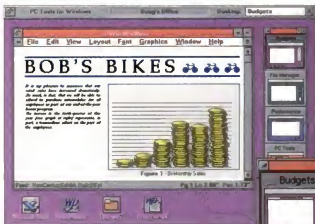
riage printer that senses if a file uses an Epson LQ570 or an IBM ProPrinter X24e emulation and switches between them automatically. The printer handles fanfold, cutsheet, labels, envelopes, and four-part forms. An optional \$55 color kit enables a user to print in seven colors.

Both printers will ship this month. DEC can be reached at (800) 344-4825.

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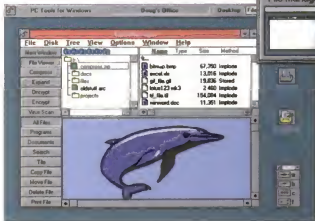
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DEC's 17-page-per-minute PrintServer laser printer features a 300-dpi resolution, 8MB of RAM, and costs \$5,995.

Advanced Digital debuts real-time video for \$1,950

BY GATE CORCORAN

Advanced Digital Systems this month will start shipping a high-quality real-time video compression board for \$1,950.

The Video Wizard can capture, compress, and play back video in a movable, scalable window measuring 640 by 480 pixels at 30 frames per second on a 386 or 486 system.

The board, which was announced at the Intermedia show in San Jose last week, gets its fast capabilities from Cirrus Logic's CL550 coprocessor chip.

It can compress video before sending it to the hard disk in Microsoft's AVI, Cirrus Logic's JPEG, or Advanced Digital Systems' MPEG formats.

The board can also capture still frames. The Video Wizard accepts three software-selectable audio and video input sources and supports NTSC and PAL video.

The board also supports real-time recording of audio, which is digitized at a rate of 22KHz per second.

Advanced Digital Systems also offers a less expensive capture and software-compression board called the Video Clipper that lists for \$465.



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Deskstation to offer low-cost RISC machines

BY CATE CORCORAN

Deskstation Technology Inc. will ship its low-cost desktop computers based on MIPS Computer Systems Inc.'s R4000 and R4400 RISC chips when Windows NT ships, probably in May.

The \$3,995 rPC/40 is based on the MIPS 50-MHz R4000 processor. It will

come with 16MB of system memory, a 3½-inch floppy drive, and a 200MB hard disk drive in a tower chassis.

The 14-inch monitor offers resolutions of up to 1,024 by 768 in noninterlaced mode. The system also includes an S3 Super VGA graphics card.

The \$4,995 rPC/44 uses the MIPS 50-MHz R4400 processor and is configured

identically.

The company has added a 512KB secondary cache to improve the speed of its systems.

The systems use standard PC AT hardware to keep systems costs down, the company said.

The machines offer better price-performance than current 486 machines con-

figured to run NT, according to Deskstation Technology. The company used 486 PCs priced from \$3,000 to \$3,500 to make its comparison, said Don Peterson, Deskstation's founder and president.

Deskstation Technology expects the R4400 system to maintain a price-performance edge over the coming Pentium machines, Peterson said.

Windows NT will come bundled with the systems, and the company may or may not charge extra for the software, depending on what Microsoft's price is, Peterson said.

"RISC offers a viable alternative to x86 PCs because they're here today, and they run NT and they run it faster," Peterson said.

Deskstation Technology is already shipping more expensive versions of the rPC/40 and rPC/44 configured for developers who are running the beta version of Windows NT.

Deskstation Technology is located in Lenexa, Kan., and can be reached at (800) 793-3375.

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DEC introduces X terminal with 17-inch display

BY CATE CORCORAN

X terminal users who need a high-resolution system without the size and expense of a 19-inch model have two choices from Digital Equipment Corp. and Hewlett-Packard Co.

Last week DEC started shipping a 17-inch color X terminal that supports a resolution of 1,280 by 1,024 for a suggested price of \$3,795.

The company also revamped its entire line by adding text and graphics acceleration boards at no extra cost. Prices range from \$2,495 to \$5,695. Current VT2000 owners can upgrade their performance with a board for \$999. All systems are available now.

The company has also added new software, including an IBM 3270 emulator that runs as a local client.

Hewlett-Packard Co. will start shipping this week 17C, a 17-inch color X terminal aimed at CAD/CAM, publishing, and commercial users.

The \$4,695 system offers a resolution of 1,280 by 1,024 for commercial users who need to see multiple open windows or for publishing users who need to see two full pages at once, said K.C. Chavda, HP channels marketing manager.

The 17C terminal comes with 4MB of memory and 2MB of video memory and works with all HP X terminal applications, Chavda said.

HP plans to reduce prices on its standard X terminals by 11 to 13 percent this week, Chavda said.

HP will begin a six-month program, called "Open for X Business," that gives buyers of an HP 800 Series server any X terminal at a 40 percent discount.

DEC is located in Maynard, Mass., and can be reached at (508) 493-5111.

HP is located in Palo Alto, Calif., and can be reached at (800) 752-0900.

Desk Station Technology did not collaborate on this product, and this ad is not in any way sponsored by Microsoft. PC Tools for Windows does not require Microsoft Windows or any future version thereof; it simply complies with other products mentioned herein are used for identification purposes only and are not trademarks of their respective companies.

Apple nurtures multimedia

Hopes development group will provide edge

By TOM QUINLAN

Intent on becoming a clear leader in multimedia-related products, Apple Computer Inc. announced last week the formation of its New Media/New Markets group to foster the development of multimedia products by other hardware and software developers.

"We don't want to be just a leader in multimedia for the Macintosh, we want to be a leader in multimedia period," said Ian Diery, executive vice president of worldwide sales and marketing for Apple, citing Apple's installed base of 1 million QuickTime users and 1.5 million CD-ROM-equipped Mac users.

As part of that effort, Apple

reintroduced its PowerCD player last week at the Intermedia show in San Jose, Calif.

The three-in-one player, which supports Eastman Kodak Co.'s Photo CD technology on a television and can be hooked up to a stereo for playing audio CDs, premiered last month at the CeBit computer show in Hannover, Germany.

Official pricing won't be available until the unit ships this summer, but Apple executives said the CD-ROM player with a 150KB-per-second data transfer rate would be priced at less than \$500.

"We don't make any money in selling the CD-ROM players," Diery said. "But it's an essential step in establishing the multimedia market."

The drivers that make the PowerCD compatible with PCs are currently unavailable, but Apple intends to equip the device for use with Intel-based systems, company executives said.

Last week Apple also introduced a set of powered speakers for use with both Macs and PCs and outlined some of the QuickTime capabilities that will be included in upcoming releases.

The next version of QuickTime for the Macintosh, due out in time for the Apple Developers Conference in May, will include support for 16-bit CD-quality sound and will add sup-



Apple's PowerCD brings CD-ROM technology to the PowerBook for less than \$500.

port for gray-scale PowerBook and Duo portables.

The software will also use less memory, enabling it to run on Apple's low-end color systems.

A new version of QuickTime for Windows, expected around the same time, will include the decompression algorithm developed by SuperMac Technology Inc. and first incorporated in QuickTime 1.5.

Tricord server boasts Pentium upgradability

By DOUG BARNER

Hoping to cash in on the client/server wave, Tricord Systems Inc. will announce this week the Pentium-compatible ES5000 enterprise server, which features symmetrical multiprocessing.

Boasting performance as high as 600 million instructions per second when fully upgraded, the system supports as many as six i486DX2 66-MHz processors, which can be replaced with the Pentium once it is widely available. Pricing starts at \$78,200.

The system has also received a RAM boost; its predecessor had a 128MB limit, compared with the ES5000's 1 gigabyte.

Using standard SCSI technology, the system can handle as many as 488 gigabytes of hard drive storage, making serious downsizing projects feasible.

Tricord has used an array of off-the-shelf technologies, in-

cluding the EISA bus and Intel i386DX chips, to drive its intelligent disk subsystems.

To keep the server running, Tricord has included a number of fault-tolerant features such as support for RAID technology, a redundant power supply, and hot replacement of disks and power supplies. Hot replacement allows components to be replaced while the system is on-line.

Tricord has put its BIOS code into flash RAM, allowing users to upgrade the BIOS by dialing into a Tricord server.

The ES5000 can be managed through Tricord's Windows 3.1-based software or through Simple Network Management Protocol and NetView.

In several weeks Tricord is expected to announce Open Fault Tolerance, where one server is fully mirrored by a second server, said Mark Garver, vice president of corporate strategy.

The ES5000 supports IBM's OS/2, Microsoft Corp.'s LAN Manager, The Santa Cruz Operation's Unix, Banyan's Vines, and Novell Inc.'s NetWare. The company plans to support OS/2 2.0, Windows NT, and Sun Microsystems Inc.'s Solaris 2.0.

Tricord, in Plymouth, Minn., can be reached at (612) 557-9005.

NEC adds features and drops prices on high-end monitors

By YVONNE LEE

Users who need a better monitor because of their move to a graphical user interface now have a more affordable option from NEC Technologies Inc.

The company plans to introduce today two 15-inch monitors and a 17-inch display designed to work with Macintoshes and PCs.

The MultiSync 3FGe and MultiSync 4FGe succeed the 15-inch MultiSync 3FGx and MultiSync 4FG.

The monitors use an NEC technology designed to maintain a sharp image from corner to corner. They have flat, square antistatic screens with 0.28mm dot pitch, and they meet the MPRI II low-emission standard.

The 3FGe, aimed at general business use, will support a resolution of 1,024 by 768 at 60 hertz and horizontal frequencies of 31 to 39.5 and 47.8 to 49.5 kHz.

NEC does not suggest retail prices for its monitors, but the 3FGe has an estimated street price of \$635—\$50 less than its predecessor.

The 4FGe adds the AccuColor color-matching scheme, runs at a wider range of frequencies, and has higher refresh rates.

The 4FGe supports horizontal frequencies of 31 to 62 kHz and supports a resolution of 1,024 by 768 at 76 hertz. Its \$755 street price is \$50 less than the 4FG's.

The 3FGe and 4FGe are scheduled to ship this month.

The 17-inch MultiSync 5FGe is targeted at GUI users who want a larger screen without giving up a lot of desk space. It has a smaller horizontal frequency range and lacks the AccuColor control system. The 5FGe, available now, operates at the same horizontal and vertical frequencies as the 4FGe. It has a street price of \$1,155.

NEC of Wood Dale, Ill., can be reached at (708) 860-9500.

DEC lines up apps, vendors for Alpha chip

By JAYNE WILSON

Amid the hoopla surrounding Intel Corp.'s recent Pentium announcement, Digital Equipment Corp. is continuing efforts to broaden the Alpha chip's reach by cutting prices, increasing the applications it will run, and entering alliances with industry leaders.

Agreements announced last month with Mitsubishi Electric Corp. and Novell Inc. call for a second source for the chip and native support for NetWare. Currently there are about 500 commercial and technical/scientific applications for Alpha and about 2,000 more under development, according to DEC.

DEC also announced that Alpha prices will drop in July from \$1,355 to \$853 per chip for quantities greater than 10,000. Although Alpha currently leads the pack of 64-bit processors in speed (about 200 MHz) and product availability, some analysts say this isn't enough.

"I think the market recognizes Alpha [technically] is a better chip than Pentium, but does that matter to the end-user?" said Dave Smith, analyst at International Data Corp., in Framingham, Mass. "Unless Alpha can triple Pentium performance at the same price, it's got a hard job ahead of it."

DEC will roll out its first Alpha NT PC when Windows NT is announced. It runs at about 120 SPECmarks, the 150-MHz version at 89. Analysts speculate it will cost around \$7,500.

Despite competition in the NT arena, DEC claims it does not view Pentium as an overall Alpha competitor because it is tied to Windows software.

"Pentium will run Windows and DOS real fast but falls short in workstation-type application software," said Bill Jackson, Alpha PC marketing manager. "In the workstation space, Solaris and OS/2 are running the show."



Tricord's ES5000 server features a multi-processor design and Pentium support.

Radius licensee introduces low-cost Pivot display

By CATE CORCORAN

Windows users put off by the prices of Radius Inc.'s Pivot monitors will soon have a low-cost option from start-up Portrait Display Labs.

In May, Portrait will ship a \$399 15-inch color Pivot monitor for Windows users.

The Portrait/15 Plus is based on Radius' Pivot technology, which Portrait is licensing. A Pivot monitor rotates from land-

scape mode to portrait mode using a hotkey combination.

In horizontal mode the monitor can display a 12-month spreadsheet. In vertical mode it can display a word processing file that prints on an 8½-by-11-inch sheet of paper.

Portrait is not targeting its product at Windows desktop publishing users because they probably already have such large monitors they don't need portrait mode, said Bruce Cum-

ings, president and CEO.

In a Windows control panel, the user can choose between a noninterlaced 1,024-by-768 or 800-by-600 resolution.

The monitor supports 256 colors and a refresh rate of 72 hertz. It has a 0.28mm dot pitch and anti-glare coating, and it meets Swedish MPRI II low-emission standards. It requires at least 1MB of video RAM.

Portrait, in Fremont, Calif., is at (510) 249-0444.

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In general, you can expect to wait roughly twice as long for a color graphics scale as for gray-scale. With a fast scanner, this difference might translate into a half a minute or so. With a slow scanner, the set up to color may cost you 2 minutes or more.

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but Hewlett-Packard Co. has gone far to make the ScanJet IIc an enabling buy, no matter what the application.

Past HP scanners have

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The ScanJet IIc performed well during all phases of PC Magazine Labs' testing. In terms of speed, this scanner led the field, ranking first in two of five speed trials and best overall. Some scanners,

HP has made scanning as simple as possible.

scanner excellence), only one Hewlett-Packard's ScanJet IIc excelled in both categories.

PC
MAGAZINE
EDITORS'
CHOICE

April 14, 1992
HP ScanJet IIc

as a whole, and a street price as low as \$1,450, and it's hard to imagine a better buy.

An excellent choice for any PC desktop

We'd hate to brag. So we'll let the PC press do it for us.

Both *PC Magazine* and *Publish* called the HP ScanJet IIc the *Best Color Scanner* for 1992. While *PC Computing* named the black & white/gray-scale HP ScanJet IIp the *Most Valuable Product* of the year.

Speed. Simplicity. And accuracy were all applauded. It's no wonder. HP's single-pass

scanning delivers both lightning-fast speed and precise color registration. TWAIN support allows scanning without having to switch between applications. And HP AccuPage technology with 400-dpi resolution can tackle the toughest OCR challenges. What's more, capabilities this advanced are now even more affordable. List price on the HP ScanJet IIc has just dropped to \$1,599. The HP ScanJet IIp is just \$879.

Impressed? Don't just take our word for it, or even the PC press's. Attend one of our scanning seminars that will be held April through September, 1993. To find out more about the HP ScanJet IIc and HP ScanJet IIp or seminars in your area, call 1-800-SCANJET, Ext. 7365*. And judge for yourself.

HP ScanJet IIc

HP ScanJet IIp



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To find your nearest reseller or to simply find out more, call us now at (800) 426-9400, Department JM5.



Microsoft
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Tech Talk / Steve Gibson

Brilliant data compression schemes could put data at risk

Before you run out to compress your hard disk with MS-DOS 6.0's new DoubleSpace capability, please read this column very carefully and consider what I have to say.

Microsoft's decision to add hard disk

data compression to the base MS-DOS product concerns me a great deal. I believe that it was an unwise decision motivated by the significant market pressures created by similar offerings from IBM's PC-DOS and Digital Research's DR-DOS rather than by a concern for the well-being of Microsoft's MS-DOS users.

All use of partitionwide data compression

is completely forbidden within my company because I do not believe that it is a sufficiently stable and robust technology. You should consider similar bans for yours. Let me explain why.

All on-the-fly hard disk compression utilities operate upon variations of the brilliant Temple-Ziv (LZ) compression technology. Imagine that your job is to

compress information for storage onto a hard disk using the fewest bits possible. As you receive the information to be stored, you also build a history buffer in RAM containing what you have received. Then, before recording any new information, you check to see if you all ready have that information in your own history buffer, and if so, rather than recording the repeated information, you store a short "pointer" that points to the occurrence of the information in your own history buffer.

In other words, the storage of repetitions of information is replaced by tiny "pointers" to prior occurrences of the same information. Once all the information has been compressed, the history buffer is discarded.

Now imagine the decompression task when that information is read back: As you read information from the disk, you record it into your own history buffer. When you read in one of the stored pointers, you instead send the information pointed to from your own history buffer.

The sheer elegance of the compression technique is apparent. Because the storing and reading processes create and maintain dynamic history buffers of past information, the compression side merely refers to things in its history buffer when redundant information has to be stored again. When the information is read back, the complementary decompressor takes those reference pointers and copies the information from its own history buffer in place of the pointer that is read. It's really very elegant.

That's the good news; now here's the really bad news: The entire scheme naturally depends upon having the history buffers at the sending and receiving ends synchronized, yet it's the case that's read back that is used to build the receiver's synchronized history buffer. If any error occurs when reading the data from the disk, the receiving dictionary will become desynchronized, and all data from that point onward will become permanently corrupted and meaningless.

When you think about it, it makes perfect sense that compressing the redundancy out of data would increase the inherent information-bearing content of each bit of data. The danger with the LZ approach is that a single incorrect data bit can obliterate the balance of the compressed data by causing the decompressing history buffer to lose its synchronization with the history buffer created when the data was first stored.

When you consider the falling price of hard disk drives, the growing value of hard disk data, and the very real throughput performance penalty exacted by compression and decompression, I hope you'll think twice and then three times before squeezing your drive's data.

You don't get something for nothing. My data is too valuable for to be placed in such danger. Isn't yours?

In case you were wondering, my own SpinRite product is wholly irrelevant here. It does not care whether a sector's data is compressed or not.

Steve Gibson is the developer and publisher of SpinRite and president of Gibson Research Corp., based in Irvine, Calif. Send comments to him at MCIMail 489-9468 or stg@grc.com on the Internet.

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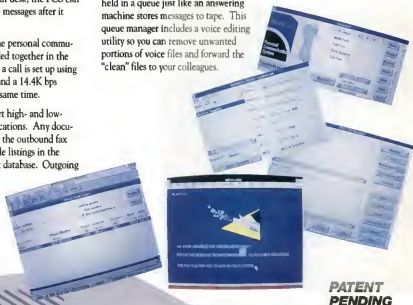
Show & Tell The patent-pending features of the personal communication system from Multi-Tech Systems are pulled together in the voice-over-data communication program. When a call is set up using Show & Tell, you have a telephone connection and a 14.4K bps datacom connection over the same line, at the same time.

Fax Manager Integrated "printer" drivers support high- and low-resolution faxing from your Windows™ 3.1 applications. Any document created under Windows can be "printed" to the outbound fax queue. Each document can be directed to multiple listings in the system "Address Book" - a user-defined recipient database. Outgoing faxes can be scheduled for immediate or delayed transmission. Incoming faxes are date- and time-stamped and then queued for viewing/printing.

Address Book An integrated database system accessible by the Fax Manager, MultiMedia Mail, and Voice Mail programs to simplify and consolidate recipient information. Address books can be created and stored as separate files, which can be indexed to find vital information using the Hyper/Search indexing algorithm.

MultiMedia Mail A message-composer and queue manager for handling documents with text, graphics, and voice annotations allows you to exchange visual and audio information between two PCSs.

Voice Mail The phone messages taken by your PCS are held in a queue just like an answering machine stores messages to tape. This queue manager includes a voice editing utility so you can remove unwanted portions of voice files and forward the "clean" files to your colleagues.



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- 4MB cache controller; expands to 64MB
- 560MB base storage; expands to 10GB
- RAID levels 0, 1 and 5
- Hot-sparing and background data rebuild for zero downtime
- Three independent power supplies with redundancy
- 14" SVGA monochrome monitor
- Northgate 101-S keyboard
- Novell certified device drivers and utilities for NetWare™ 3.11
- Vertical case
- Five year limited warranty

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NEWS / NETWORKING

DOS, OS/2 help desk system uses multimedia

Company also developing a Unix version

BY TORSTEN BUSSE

Software Artistry Inc. will ship this month a new OS/2 version and an enhanced DOS release of Expert Advisor, its help desk automation software that integrates call- and problem-tracking capabilities with problem diagnostics.

Both versions of Expert Advisor combine knowledge-based

expert systems and hypermedia decision trees to lead help desk staff through problem resolution procedures. From a single screen, users have instant access to inventory information, caller-specific data, and call and problem histories.

In addition, the application offers a wealth of problem determination facilities, including rule-based expert systems and

case-based reasoning.

Expert Advisor can also be tailored to support individual customer needs.

"It doesn't take a programmer to do it," said Mike Vils, information center supervisor for Color Tile Inc., in Fort Worth, Texas. Vils and his six help desk staffers support 1,600 users at 800 locations, handling an average of 13,000 calls per month.

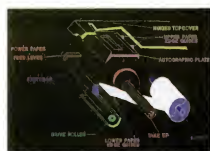
Expert Advisor has helped the floor coverings company reduce the average call time from 10 minutes to less than 2 minutes.

"Most importantly, every caller now gets the same response to the same problem," Vils said.

Expert Advisor offers an integrated E-mail package and problem routing and escalation facilities.

The software also supports voice annotations, voice-to-text translations, full-motion video, and graphics.

David Heveran, help desk manager at Eckerd Drugs in Clearwater, Fla., which operates 1,700 pharmacies and retail stores throughout the South and



Animation makes it easier to give detailed instructions to people calling the help desk.

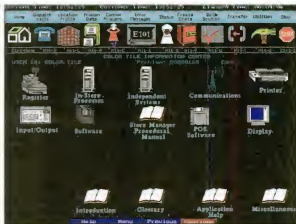
Southeast, said the ability to load color photographs of each supported product into Expert Advisor greatly simplified hardware support and maintenance. "In a three-month period after installing the product, we increased the first-time caller resolution by 76 percent," Heveran said.

Software Artistry is working on a Unix version of the product, which will be available late this year. A Windows NT version is also on the agenda and should hit the market in early to mid-1994, said Scott Webber, president of the Indianapolis-based company.

Shipping now, Expert Advisor 3.0 for DOS is priced at \$45,000 for a 10-seat LAN. It runs on all popular LANs, including NetWare.

Expert Advisor 1.0 for OS/2, available April 30, is priced at \$65,000.

Software Artistry can be reached at (800) 795-1993.



Expert Advisor's central screen displays icons that give users instant access to caller profiles and problem histories.

Windows package offers keyboard chatting feature

BY JIM HAMMETT

Simultaneous file swapping and keyboard chatting between two capabilities that let users set up phone books, dial directories, and configure and move a user toolbar.

"It has a lot of depth so you can configure it on a system with some advanced application tools, which is a big plus for us," said Steven Wille, a beta tester and senior vice president at Guarantee National Insurance Co., in Denver.

Wille—who said he uses the program primarily for transferring files—also said that PowerLine is easy to use, offering guidelines and examples so users who are unfamiliar with a communications application can

quickly get up and running.

"Installation was easy because there are predefined setups for major on-line services such as CompuServe," Wille said.

Steve Adorian, president of Cybernetic Communications Systems, in Lock Port, N.Y., described PowerLine as one of the best products in this category that he has used.

"Two-way file transfer and keyboard chatting are good features that corporations will probably find useful, since it gives a user the ability to let someone know, using the keyboard, when a project or document is finished," Adorian said.

For users whose PCs have sound boards, PowerLine takes advantage of Windows' multimedia capabilities, offering visual and audio help systems.

PowerLine will retail for \$149. Enable Software is headquartered in Balacon Lake, N.Y., and can be reached at (800) 766-7079.

Fastnet card doubles Ethernet bandwidth

Provides 20Mbps performance

BY JAYNE WILSON

PC users can double their dedicated Ethernet bandwidth without any wiring changes by using a new adapter card slated to ship in May from Kodiak Technologies.

Touted as the industry's first full-duplex Ethernet card, Fastnet promises ISA-based PCs hooked to switching hubs a full 20Mbps per second (Mbps) of performance. When used with existing hubs, the product provides standard 10Mbps Ethernet speeds.

"Fastnet costs about the same as a regular Ethernet adapter card," said Sam Brown, president of Kodiak. "Users can install it now, and later when they upgrade to a switched hub, they will have the capability to create virtual dedicated 20Mbps connections and add bandwidth

on a per-user basis," he added.

The card supports the full-duplex bandwidth-on-demand standard for Ethernet. Unlike high-speed network technologies such as FDDI, full duplex is compatible with existing installed wiring.

When used with regulation twisted-pair telephone cable, connected nodes can send and receive data simultaneously without causing collisions.

The Fastnet card plugs into any ISA-bus PC and supports Novell Inc.'s NetWare, Microsoft Corp.'s Windows for Workgroups, Banyan Systems Inc.'s Vines, Artisoft Inc.'s LANtastic, and Digital Equipment Corp.'s Pathworks network operating systems.

Fastnet is priced at \$349. Kodiak Technology is located in Fremont, Calif., and can be reached at (510) 226-7840.

PIPELINE

SHIPPING

Accunetics offers

intelligent repeaters

Accunetics Inc.'s new nonproprietary repeater/multiprotocol router combines multiprotocol routing, bridging, WAN connectivity, and server tasks. Pricing for the NMS-2300 line of intelligent repeaters for 10Base-T and 10Base-2 networks starts at \$6,500. (800) 446-7769.

SafeDeposit, automated backup software for the Macintosh, is now shipping at an introductory price of \$99 from Dyna Communications Inc. SafeDeposit lets traveling PowerBook users back up to their home networks. (801) 269-7311.

Thomas-Conrad Corp.'s Ethernet adapter comes preconfigured and can be used as soon as it is plugged in. The TC5143 Ethernet supports a cabling distance of 328 feet. The TC5143-2 adapter for 10Base-2 thin Ethernet networks supports distances of up to 607 feet. Each version retails for \$159. (800) 332-8683.

UPGRADES

WinNet plus 1.2

gains AFP support

Cogent Data Technologies Inc. has added Apple File Protocol support to the latest release of its network connectivity software, WinNet plus. With Version 1.2 of WinNet plus, workstations running MS-DOS or Windows can access the resources of a Macintosh server. WinNet plus also supports FTP Software Inc.'s PC/TCP, Novell Inc.'s LAN WorkPlace for DOS, and NetWare 4.0. Version 1.2 is available now for \$149. (206) 378-2929.

Compatible Systems Corp.'s

software update for its RISC Router 3000E has increased the throughput to 14,800 packets per second. Priced at \$2,995, the network protocol provides Ethernet-to-Ethernet routing and includes support for TCP/IP, DECnet, and AppleTalk. (800) 356-0283.

PRICE CUTS

PowerBook fax/modem

becomes cheaper

Picocon Inc. has reduced the price on its PowerBook fax/modem by 27 percent, to \$329. The PowerBook fax/modem sends and receives data at 14.4 kilobits per second. (408) 432-8030.



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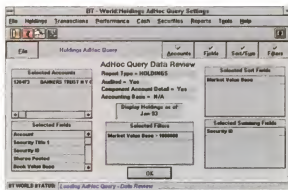
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Above: BT-World makes it easy for Bankers Trust's clients to get important information on their portfolios. Right: These are the

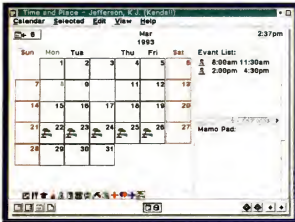
tools used to create BT-World, an online solution that's giving Bankers Trust a worldwide competitive advantage.



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Product Spotlight

IBM manages time for groups



IBM is shipping a LAN-based time management package designed to help coordinate and schedule work group activities.

Time and Place2, which operates in a client/server environment, includes a desktop calendar, a generalized time manager, a to-do and memos feature, and automatic messaging to users who don't have the calendar. It provides cross-platform messaging through support of the Vendor Independent Messaging standard.

It also supports specialized ease-of-use features including extensive on-line help and OS/2 Workplace Shell drag-and-drop functions.

Time and Place2—a key component of IBM's LAN office solution—supports both OS/2 2.0 32-bit and Microsoft Windows 3.1 clients. The **Time and Place2** server software, which runs as an OS/2 32-bit application, uses IBM's Extended Services Database Manager and will support Database 2 OS/2, Version 1. The package operates with the NetBIOS from either IBM's OS/2 LAN Server or Novell Inc.'s NetWare.

The **Time and Place2** server is now priced for \$595, with clients priced at \$55 each. IBM is in White Plains, N.Y., at (800) 426-3377.

SynOptics integrates module with NetWare

Optivity works with NMS RunTime

By TORSTEN BUSSE

SynOptics Communications Inc. will ship next month a management application for Novell Inc.'s NetWare Management System (NMS) that will allow administrators to manage SynOptics System 3000 and 2000 Ethernet and Token Ring hubs.

Optivity for NetWare is a snap-in module that will be tightly integrated with NMS' mapping module (previously known as the NetWare Management Map and now called NMS RunTime) and its Management Information Base (MIB) browser.

"Optivity is seamlessly integrated with NMS and does not require any knowledge of MIBs or MIB browsers to manage hubs," said Tom Dyal, product manager at SynOptics.

In April the company will ship Ethernet LattisNet and LattisSwitch System 3000 with bilingual management agents that support IP and SNMP over IPX.

The agents automatically detect whether IP or IPX is used for communications.

IPX support for Token Ring in the System 3000 will become available later this year, company officials said.

The agents will forward more than 50 different alarm traps to the NMS console, alerting users to port failures, power loss, beaconing rings, performance degradation, and other such potentially troublesome events.

The application also integrates the company's Expanded View for Ethernet and Ring View for Token Ring management software, which allows users to click on a hub icon and get a full view of which network nodes are attached to the concentrator.

An IPX-SNMP upgrade kit for existing Ethernet network management modules will be available in June. Pricing ranges from \$2,995 to \$6,395, depending on model and configuration.

Under an OEM agreement, SynOptics will offer **Optivity** for NetWare bundled with NMS RunTime for \$3,495.

SynOptics is based in Santa Clara, Calif., and can be reached at (408) 988-2400.

Low-cost groupware system offers some Notes features

By DOUG BARNEY

A Windows-based desktop conferencing package from GlobalStream Corp. offers a subset of Lotus Notes' functionality at a fraction of the cost, users said.

Unlike Lotus Development Corp.'s Notes, which requires that users develop specific applications, GlobalStream's TeamSync network-based groupware system works right out of the box.

TeamSync offers the capability to hold live discussions or contribute to topics over the course of several days or weeks. These discussions, which are organized by topic, can include video clips, sound, charts, spreadsheets, and graphics.

Discussions can be created by any user on the system. Users can join discussions by clicking on the particular icon. In addition, a user can join in multiple simultaneous discussions.

The product's Transcript area tracks all files and messages related to a topic. Users can also see who has been invited to the discussion by looking at the At-

tendee List.

Although TeamSync is billed as a conferencing system, Vinca Corp., a disk subsystem developer in Orem, Utah, uses the product for project tracking.

"We are using it mostly for a long-term development project," said Richard Ohran, vice president for Vinca. "We log all the events that occur, so if

products firm in Hillsboro, Ore., uses TeamSync to keep people posted on the status of projects. The firm had been spending hours each week in meetings and distributing project information to employees. With TeamSync, all users can be updated simultaneously, said Earl Snee, engineering manager at the company.

"It saves me 4 or 5 hours per week just in communication time," Snee said.

In addition, TeamSync makes sure details aren't lost and allows users to see all questions posed, Snee said.

The package is compatible with Novell Inc.'s NetWare and peer-to-peer systems such as Microsoft Corp.'s Windows for Workgroups and Artisoft Inc.'s LANtastic.

Future versions will support Apple Computer Inc.'s Macintosh, IBM's OS/2, and Microsoft Corp.'s Windows NT.

TeamSync is available in a five-user pack for \$99.

GlobalStream, based in Gig Harbor, Wash., can be reached at (800) 685-7858.

TeamSync discussions can be carried on over several days.

something no longer works, we can go back, research the log, and see what changed," he said.

"Everyone is linked together," Ohran said. "It creates a running log of events and graphics, along with dates and times, that is accessible to everyone through the net."

Instrumedix Inc., a medical

Tivoli package eases management

Setting up file sharing on Unix requires less time

By TORSTEN BUSSE

The latest upgrade to Tivoli Systems Inc.'s Management Environment features an application that automates and simplifies the management of network file systems.

Release 1.6 of the Unix-based Management Environment features Tivoli/File System Management (FSM) services, which reduce the time systems managers spend configuring file sharing rights for each system, said Scott Harmon, director of product marketing.

"Setting up file sharing facilities under Unix is a very complex and time-consuming task because each machine can be configured as either a client or a server, and the relationships between systems change all the time," Harmon said.

Tivoli/FSM lets users create templates that allow for changes to multiple workstations at a time, similar to how electronic software distribution tools function, Harmon said.

"Once the changes are pushed out to each individual workstation, the users receive a report about the success of each installation process," Harmon said.

Tivoli/FSM has a graphical



Tivoli's new administration application, Tivoli/FSM, automates and simplifies management of Unix's network file systems.

user interface for defining the templates and offers a network-wide view of file system configuration and file activities. It also simplifies using the Unix utility Automounter, allowing novice staff to use it.

Also new in Release 1.6 are enhancements to Tivoli/Courier, the electronic software distribution tool, which started shipping with Management Environment nine months ago.

Courier now allows for incremental software updates, men-

ing only software that has changed since the last update will be distributed to the workstations. The enhancement also enables users to take a software inventory for each workstation on the network.

Tivoli's Management Environment starts at \$40,950 for a 30-node network. It runs on Sun Microsystems Inc.'s Sparc workstations or servers running Solaris 1.0 or SunOS 4.1.1 or later.

Tivoli, in Austin, Texas, can be reached at (512) 794-9070.



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North Hills' minihub allows management of remote PCs

BY JAYNE WILSON

North Hills Electronics Inc. will ship in May a low-cost minihub designed for managing branch office LANs from headquarters sites.

The LAT2000 accommodates three modules to support a maximum of 36 users. It can handle as many as 12 unshielded twisted-pair (UTP) connections

per module and as many as six shielded twisted-pair (STP) or coaxial connections per module, the company said.

"The [LAT2000] communicates with larger control mechanisms elsewhere, allowing PCs on branch office LANs to connect to headquarters LANs," said Bruce Storch, North Hills assistant managing director.

"It allows headquarters to manage re-

move PCs while letting remote users tap into headquarters resources," Storch said. The product requires no on-site technical help, he added.

The product is SNMP compatible and supports both Token Ring and Ethernet protocols. It fits into a standard 19-inch rack.

LAT2000 comes with LANorama software, which makes it possible to manage

down to the workstation level.

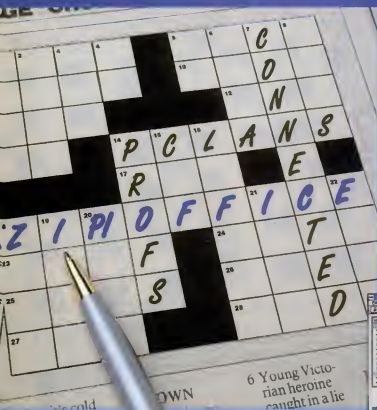
"Things that normally cause system errors can be monitored and managed from the headquarters," Storch said. "For example, the system can identify a server being out of paper or a disk door product unlocked. Many other products only manage network statistics and ensure the network is up and functional but don't necessarily go down to the workstation level."

The LAT2000 minihub will be priced at \$4,320 for a typical 24-user configuration.

North Hills Electronics is located in Syosset, N.Y., and can be reached at (800) 753-4526.

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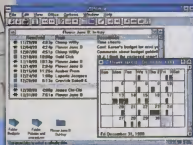
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ABILITY CONNECTIVITY



Grafpoint's X for Workgroups gives Microsoft WFW users push-button access to X Windows applications.

Windows for Workgroups to get an X link

Grafpoint Inc. is poised to give Microsoft Corp.'s Windows for Workgroups a networking boost with an X Windows server implementation of the workgroup software.

The company's X for Workgroups is server software that gives PC users access to X Windows applications on a host while concurrently running Windows for Workgroups.

Grafpoint's X server for WFW also comes bundled with its own implementation of TCP/IP. This means managers can support PC-to-X Windows links by installing only one package.

Grafpoint's terminal emulation software also provides Windows management with remote managers such as Motif, Open Windows, or DEC Windows.

X for Workgroups is a subset of Grafpoint's X-One terminal emulation product line.

The company also plans to support Microsoft's Windows NT, said Lisa Christiansen, product manager.

The product is currently in beta testing and will ship in early May, Christiansen said.

A single-user package costs \$395. A five-user package is available for \$1,995. From May to August, Grafpoint will sell the single-user version for \$239.

Grafpoint is headquartered in San Jose, Calif., and can be reached at (408) 446-1919.

— Cheryl Gerber

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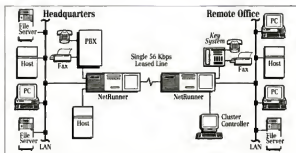
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PC Week 1/25/93 by Herb Bethoney

Scoreboard Overall score 4.4

MacWEEK

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MacWeek 12/14/92 by Mel Male

Scorecard Overall value ♦♦♦♦

MACWORLD

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Macworld 4/93 by Charles Seiter

MW ★★ ★★



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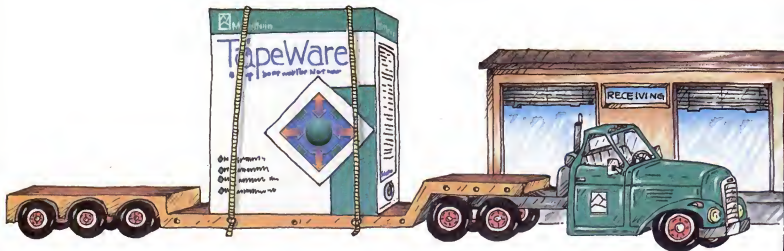
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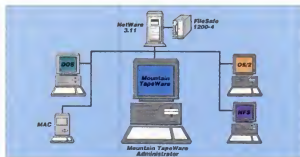


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LAN Talk / Paul Merenbloom

DOS + Unix = Using your HEAD and watching your TAIL



Regardless which network operating system you use, you probably use DOS batch tools to manage and organize your networks. Although more robust than even DOS BATCH language has limits that can prove frustrating.

There are, however, products that greatly enhance the native DOS tools. And, to the surprise of many, these tools come directly from DOS' cousin: Unix.

Unix has often been criticized because of its terse (user unfriendly) structure, but the power of its tools and flexibility have converted many, including me. Having spent several years submerged in the Unix world, programs such as GREP and MV have become staples of my shell (the Unix "batch" language) code.

Apparently, others have also found these valuable and ported them to the DOS world. Have you ever heard of GREP, EGREP, CHMOD, WC, DIFF, TAIL, TS, HEAD, or MV?

EGREP, and its cousin GREP, were precursors to tools such as Norton's Text Search; they enable you to search through files and directories and to extract data based on user-defined criteria. For example, the command

```
EGREP -e -i -C -n "foobar"

```

searches a directory (containing log files, for example) for the term "foobar."

In this example, each time EGREP finds the string "foobar" it will print the line containing the text, plus the two lines before and after it. The -i instructs EGREP to ignore upper- or lower-case differences. The -n parameter instructs EGREP to print the line number (plus file name) of each match.

EGREP (and GREP) also offer a wealth of switches that let you further limit the searches to beginnings of lines, ends of lines, after nulls, etc., all on a single pass and using a single command line.

This is an especially useful tool when searching for the proverbial needle in a haystack. With its speed and flexibility, I often use EGREP to find specific file names or dates from my 5MB-to-7MB ASCII backup tape records. This is usually faster than searching for a specific file via the backup tape system's catalog.

Have you ever wanted to view (or print) the last 30 or 40 records in a file? This can be a real chore if the file is larger than 20KB. The TAIL utility can quickly provide you with the last last "x" lines (where x is a number between 0 and 350). TAIL can be used in reverse:

```
TAIL -x e filename

```

to look at the first "x" lines of a file.

Similarly, a utility called HEAD can also look at the tops of files. When combined with redirection to a printer port (or file) TAIL can turn a 30-minute job into a 30-second task.

Combining EGREP, redirection, TAIL (or HEAD), and redirection (again) can really beef up your batch routines. So if you took the command

```
EGREP -e -i -C -n "foobar"

```

and added the redirection

```
EGREP -e -i -C -n "foobar" > foo.out
and followed this with the command
TAIL +100 foo.out | more

```

you could take the output of the GREP, look at the last 100 lines and have that output "paged" using the DOS MORE utility via DOS' piping.

There are others, too. CHMOD allows you to easily change attributes of files

(such as read, write, and hidden). WC counts the number of words in a file and DIFF will compare the contents of multiple files.

MV is a favorite. It's the Unix "move" command and is capable of moving entire directory trees (files, structure, etc.) on or between disks in a single line.

The best part is that these utilities are

either free or shareware and are available via CompuServe. To download these gems, simply type GO IBMFF at the CompuServe prompt and enter GREP, TAIL, etc. as the key search word.

When added together, these tools significantly increase the power and flexibility of your DOS batch routines. The only limit is your imagination.

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Paul Merenbloom is manager of information technology at Otsuka America Pharmaceuticals, in Rockville, Md. Send comments to him via CompuServe at 70743,31524 or via MCI Mail at Paul Merenbloom.

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TO THE EDITOR

INFO WORLD

Support trial balloon

I feel that the horrified reaction and apocalyptic response models of several prominent managers is way out of line. (See "Software vendors dazed by predictions that software prices will plummet," March 15, page 12.)

Let's look at this puzzle one piece at a time. First, David Watkins of Borland International says that 105 people years of development can't be sold (profitably) for \$79.95. I beg to differ. Assuming a \$60,000 per capita expense for each of the person-years attributed to this development effort, a company would need to sell just 79,000 units of the product at full price to recoup the costs of development, or 109,000 units at the currently popular "channel price" of \$58. In a market that has become as commodity oriented as the software business, such sales goals are not unreasonable.

I'm even more concerned by the comments from WordPerfect Corp.'s Dan Lunt. Mr. Lunt correctly asserts that the "free" support model will have to change if prices fall into the \$50-to-\$100 range. However, with all due respect to WordPerfect's technical support effort, the state of the art for phone support at most companies is hardly worth paying for, anyway.

In short, the software vendors appear to be doing some before-the-fact damage control rather than planning and organizing changes to adapt to market evolution.

Jeff Yablon

Editor
IYM Software Review
Mount Arlington, N.J.

Internet addresses

In "SPA investigates reports of rampant piracy on the Internet" by Shawn Willett (March 22, page 12), you refer to the warez channel. There are no such things as "channels" on the Internet; "particularly the warez channel" means absolutely nothing to most people on the net. Warez may be a specific site (i.e., there can be a "warez college") and I can't find any references to a "warez" anything, but Mr. Willett should have specified that.

While I agree that software piracy is a valid concern, I would wager that the fault lies with a small number of people on one or two computers that are on the Internet. Your article has the same effect as articles that portray BBes as havens for pirated software. It unnecessarily smears the reputations of those nets as a whole instead of blaming the specific individuals.

Jim Niemira
Senior SysOp, Frontier Science
niemira@fsr.org

Thanks for the letter, but you are putting your status as Internet guru in jeopardy. Try the IRC (Internet Relay Chat) option. There are many channels active at any given time, warez frequently among them (although its popularity may have declined recently). InfoWorld doesn't mean to imply any significant percentage of Internet users are illegally pirating software. But it should be pointed out that security issues on Internet will have

to be addressed if it is to be used for more commercial purposes, including the data superhighway. — Editors

Gateway self control

What I want to know is, why hasn't Gateway's management decided to limit sales to prevent quality control and support from deteriorating? (See "Wait! says Gateway only has to catch up with itself," March 22, page 106.) Gateway's decision to sell as many computers as it can get out the door has so far cost me three weeks of down time, causing me to stop a project I was creating and farm out the work that I could have done myself.

How is the United States to overcome the economic effects of foreign manufacturers, who steadfastly deliver quality in their manufacturing and service? I would gladly have paid much more for a computer, and I am sorry to say, a foreign one at that, to avoid the huge amount of time and expense I have incurred.

I feel that Gateway's management isn't telling the truth about the risks we are taking by using their computers. Even if Gateway feels it is appropriate to degrade its service and quality to have as many sales as possible, it should be more respectful to its customers and stop advertising "enchanted service" when it is simply not true. I feel used by Gateway managers, who have gone for the gold at my expense. Reminds me of the automobile industry — and look what happened to it.

Denis Alan Glick
Chicago

Government money

I am reminded of the story of the emperor's new clothes as so many computer publications fawn over President Clinton's proposed government spending on "high-tech" research. But, finally, someone has the sense and courage to say that the emperor has no clothes. Ed Foster's March 8 column (page 41) was a breath of fresh air. Is he the only one who can see that government involvement hurts, rather than helps, our industry?

Consider how the computer industry has fared under Republican neglect over the last 12 years. Companies such as Microsoft, Dell, Compaq, and many more were born and became huge successes. Some companies folded, but the capable employees of less effective companies found productive work elsewhere. Could it be that our industry has succeeded because of limited government interference?

Mike Hill
San Antonio

Hidden costs

In "Special Report: Windows muscled in on Mac's DTP turf" (March 22, page 1), Jeannette Borquo says Steve Suche as saying that "the Mac is an expensive luxury from a business point of view." The accompanying chart compares a Gateway 2000 and an Apple Quadra. While some space is given to

counterclaims, the tone of the article indicates that the Mac is much more expensive than comparable PCs.

However, the systems listed aren't comparable. Does the Gateway have a stereo sound board? Where is the price of the network software? Why are we comparing a clone instead of a machine from a major manufacturer, such as IBM or Compaq? Are we comparing list prices or street prices?

The article also leaves out the most important advantage of the Mac over the PC. The PC has segmented memory. This leads to much more difficult installation of system software, including Windows. Try explaining the meaning of extended vs. expanded memory to your receptionist some time. In all of the price comparisons I've done, where comparable configurations are being compared, the price difference between the Mac and the PC nearly disappears. What's left is a small price to pay for easier system maintenance.

Rich Wiegarter
Zip Consulting and Design
Stanford, Calif.

Comparing Apples to PCs fairly is difficult, which is why InfoWorld asked for help from an independent consultant on its pricing chart and also showed drafts of it to both Apple and Microsoft. Aspects of the two systems were adjusted based on comments received, and many factors not specifically related to desktop publishing, such as sound boards, were not mentioned.

Concerning prices, the chart presents both the list prices and the discounts commonly received by users, according to the consultant we quoted. We used a Gateway system because low-priced PC clones are fueling much of the move to Windows, as the article suggested, so the lack of a low-priced Mac clone was thought to be a relevant point of comparison. — Editors

Rules of fair play

I have as much sympathy for Gordon Eubanks as I would have for me or anyone else who had copied Symantec software and distributed it to several computers. (See One on One, March 15, page 110.) Mr. Eubanks certainly must have expected Borland's concern over his hiring of Gene Wang to manage the languages group. And yet, he and Mr. Wang apparently played fast and loose with sensitive information over E-mail, doing little to disguise their intentions. Mr. Wang certainly can use his management skills and programming expertise in his new endeavor, but trade secrets must stay behind at the company that worked long and hard to nurture its position in the market.

Rick Goldfarb
Fresno, Calif.

Please write to Letters to the Editor, InfoWorld, 1555 Bove Road, Suite 800, San Mateo, CA 94402; (MCJ Mail: 259-4127; CompuServe: 73267.1537; Internet: letters@infoworld.com). Letters may also be faxed to InfoWorld at (415) 358-1269. Please include your name, address, and daytime telephone number. Letters selected for publication will be edited for length and clarity.

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From the Editor / Ed Foster

Gripe line reveals angry vendors — yes, I said 'vendors'

Not only is there a lot of anger out there, it's showing up in some unexpected places.

This week's gripe comes courtesy of a reader we'll call Mr. Fair, for Fairly Average InfoWorld Reader. Mr. Fair was recently evaluating a graphical programming tool called Baby Driver for his large corporation. Having had some trouble earlier getting through to the company's technical support, he faxed the manufacturer a question about a problem he was having with example code that ships with the product.

In his fax to Autumn Hill Software, the developers of Baby Driver, Mr. Fair also issued fair warning that he was leaning toward not recommending Baby Driver for other programmers in his company. "We have paid several hundred dollars for a software package that won't even work properly with the examples it comes with," he wrote in the fax. "Suffice it to say that so far I am thoroughly unimpressed."

Within an hour, Mr. Fair had his answer and then some from Autumn Hill. The fax he got back explained the solution, while implying that if Mr. Fair were a true professional, he could have figured it out for himself. "Most professional developers would have realized this — perhaps you did not, or perhaps you are not?"

And the author wasn't finished. He suggested that if Mr. Fair was unimpressed with Baby Driver, he should try writing his own program, an effort the costs of which he proceeded to calculate. "That adds up to about \$185,000, and you are



bitching about \$300. I never cease to be amazed at (a) the poor arithmetic skills of our customers, and (b) how quick they are to find fault with our product when statistics show that 99.99 percent of all 'bugs' and 'problems' stem from user incompetence. Feel free to return the product if you like." The fax was signed by Mary Luse, president of Autumn Hill.

Needless to say, Mr. Fair was fairly shocked to receive this response. In fact, I could still hear the outrage in his voice when he left his message on the gripe line, and he hadn't cooled down much when I talked to him later.

"What an appalling attitude," Mr. Fair said. "I've given up on the product. Who wants to deal with someone who feels that way about his customers?"

I've had gripes about rude support before, but nothing quite like this. I had to talk to Mary Luse just so I could understand for myself what was going on there.

I think I was half expecting to find a raging lunatic, but Mr. Luse turned out to be relatively mild-mannered and quite rational. He was a bit abashed that his response to Mr. Fair had come to my attention — but only a bit. "After dealing with some of these people day in and day out, you do sometimes say something you regret," he said.

He didn't regret it that much, though. Although he acknowledged that the 99.99 percent statistic was a bit of hyperbole, he stuck by his basic point. "Maybe it's 90 percent, maybe it's as low as 70 percent," he said. "But I honestly think there's an

alarming trend in the industry toward less and less competent developers. You've got a bunch of end-users with programming tools out there who shouldn't be practicing the profession."

Autumn Hill is a small company, with just 10 employees and half a dozen products to develop and support. Everybody does everything, and Mary Luse often helps handle support calls. He and his staff regaled me with stories of not just incompetent users but abusive and offensive ones as well. Life in the front-line trenches of technical support can be tough and frustrating.

I'm not in a position to judge whether Luse is right that Mr. Fair should have been able to solve the problem. All I know is that they are both far more technical than I am. And the issue Luse raises of creeping incompetency among programmers is not one I wish to touch just now either.

What does intrigue me about this little incident is what it reveals about some of the anger on the other end of the phone in the support situation. I started the gripe line when I realized just how angry many of our readers were about the way they were being treated, and we've seen that they have plenty of good reason, Mr. Fair among them.

Mary Luse is angry too. Whether he's got the right to be is debatable, but I suspect he is unusual among vendors only in his bluntness. I think it's fair to say there's a lot of anger on both ends of the line, and that's a scary situation for all of us.

Ed Foster is editor of InfoWorld. He gets electronic mail at MCI account 584-3453. Or, you can call (800) 227-8365, Ext. 710, to report a gripe you have with a vendor.

Peer to Peer / Jonathan Ezor

Blanket licensing would help both publishers and network managers

Jonathan Ezor is a corporate attorney in New York. He can be reached at jezor@panix.com on the Internet.

It is clear that software publishers are serious about network piracy and that some better mechanism for tracking programs on a network is needed. I have a proposal that should answer both the software publishers' and network owners' needs: a blanket license.

Here's the current situation. When a wide area network reaches thousands of machines, spot checks of individual systems aren't feasible. Further, license metering or remote cataloging of network PCs only works if reviewed constantly. Also, any software-based protection (such as copy protection) can be evaded by other software. Finally, even the best metering software may not block uploading and downloading of software.

For their part, software publishers have reacted slowly to network growth. From shrink wrap to site licenses, publishers adopted licensing types only after computing developments became widespread. Publishers also charge different amounts for each license, and network owners cannot afford to negotiate site licenses for each program that might be on their systems.

Network owners need protection against liability at a lower cost than individual licenses or constantly monitoring every drive and server for unlicensed software. Publishers desire payment for each copy of their software.

The solution is blanket licenses. A blanket license entitles purchasers to unlimited use of all products covered by the license without individual fees or negotiating with producers of the products. Generally, a consortium of produc-

ers may load or remove software at will without liability but not sell it. If purchasers want manuals or support for programs, they can negotiate with individual publishers.

Assuming the blanket license is priced properly, it is less expensive than monitoring a company's copying activities or buying individual licenses for all programs. It enables network owners to redirect resources from monitoring to virus protection, system support, and

ware publishers cooperate, so incentives exist for both large and small publishers to join the effort.

Establishing blanket licenses is not simple. One major hurdle is the legal concern of antitrust violations. Other blanket license sellers have been targeted by antitrust suits alleging price-fixing. However, software blanket licenses would not preclude individual negotiation by software publishers with smaller network owners or shrink-wrap sales to individuals, so antitrust concerns are minimized.

Another difficulty is allocating revenues in a way that is acceptable to participants. But again, past examples such as the Copyright Royalty Tribunal for television programming serve as useful precedents.

It is time to act rather than react, to look ahead to the problems in the explosion of enterprise computing and put into place a license serving both publishers and users at minimum cost and maximum benefit.

"Peer to Peer" gives readers a forum for discussing computing and management issues. Send submissions to Rachel Parker, Opinions Editor (MCI Mail 340-4371). Submissions can also be faxed to (415) 358-1269.

If publishers of all sizes cooperate in selling blanket licenses to networks, they lower enforcement costs while increasing revenues.

ers sells blanket licenses, collects revenues, and distributes revenues to members.

Software blanket licenses would not replace existing licensing but would target only WANs for which preventing copying is too costly. Under this approach, a representative of all software publishers grants licenses to purchasers for unlimited copies of any software on their networks and local drives. The pur-

other tasks.

If publishers of all sizes cooperate in marketing blanket licenses to networks, they lower enforcement costs while increasing revenues (including license sales to system owners who don't have their particular program on the network).

Blanket license economies are such that licenses can be sold for a much higher price if all, rather than a few, soft-

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From the Ether / Bob Metcalfe

Get ready for personalized newspapers

You have enough blank paper at the top of this page, so all you need now is a pen and a receptive mind. I'll begin transmitting when you're ready.

Ready? Pick a number between one and 10. Multiply by nine. If the result has more than one digit, add them together. OK, subtract five. Take the new number and find the letter in the alphabet to which it corresponds: 1 to A, 2 to B, 3 to C, 4 to D, 5 to E, and so on. Pick a country that begins with your letter. Pick an animal that begins with the second letter of the country. And, because we'll be needing it later, write down the animal's color.

Which brings me to my subject this week: the future of newspapers, or, to be more specific, how will the accelerating onslaught of information technology eliminate *InfoWorld* as we know it?

At *InfoWorld* we use PC and networking technologies out the wazoo, but still each week we print 225,000 100-page copies near Chicago on Saturday and distribute them around the United States by air on Sunday so they can arrive at most of your doors on Monday.

Wondering about all these pounds of paper and their timely transportation in this electronic age, I sought the comments of Nicholas Negroponte.

In 1985 Professor Negroponte founded MIT Media Laboratory, in Cambridge, Mass. ([617] 253-0338). Since then, the Media Lab has grown to be one of the most successful and envied research laboratories in academia, and Negroponte has become the most interviewed media technologist on Earth—a

professor with a PR department.

My challenge was to get from him something about personalized electronic newspapers that he has not already said. (For more see especially his "Products and Services for Computer Networks," *Scientific American*, September 1991.)

Of course all publications will eventually go fully electronic, he said, but (as if to reassure me) not soon, and newspapers will be the last.

Paper is flexible, flat, reflective, and cheap. Computer displays as good as paper will be a long time coming—flexible is especially hard. There is some work on making erasable electronically writable paper, but don't hold your breath.

And newspapers are already very interactive. Ever wondered why daily newspapers are printed on so-called broadsheet paper, weekly newspapers like *InfoWorld* on smaller tabloid-size paper, monthlies often on 8½-by-11-inch stock, and books typically smaller than that? Negroponte says that the more frequent the publication the larger the paper, so that readers can make better use of their scanning abilities to interact with the publication to find what they want speedily.

It is likely that newspapers will become electronic only as interactivity (personalization) can be introduced. Negroponte sees the broadcast of newspaper information at 20Mb per second at night over TV channels, with filtering done close to the reader. In fact, as newspapers go electronic, the editing function will move toward the reader.

With an eye on meeting payroll, I asked about advertising. Bucking the academic trend, Negroponte sees elec-

tronic newspapers full of advertising. And he sees that advertising, especially as it becomes more targeted, will increasingly be seen by readers as news.

In the electronic world, newspapers will know much more about their readers, most of whom will be happy to share that information. So, instead of advertising to all the readers of a newspaper, companies will pay to speak only to those readers interested right then to buy their products. This will be more economical for publishers and advertisers and more welcome by readers. In Negroponte's words, a win-win-win.

How will all this information be collected about readers? Before I get to telephony, Negroponte asks you to imagine buying an airline ticket from Boston to Scotland. Within days you receive advertising on fly fishing and golf equipment. What other actions might be observed and what other complicated deductions made by electronic publishers to bring their readers the right buying information just when it's needed?

The big idea is the development of an electronic model of each reader. Using this model, information can be filtered or directed to a reader. This model can be built with the readers' help or by electronically observing behaviors in the relevant markets, or, if I may say so now, via telephony.

In case you doubt that minds can be read, it's time for me to confirm that the color I asked you to write up top is gray.

Bob Metcalfe is publisher of InfoWorld. He invented Ethernet at Xerox PARC in 1973 and founded 3Com Corp. He receives E-mail via the Internet as bob.metcalfe@infoworld.com or at 524-1127 on MCI Mail.

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Telephone: *InfoWorld* has a human being on a switchboard during the day (an increasingly rare phenomenon, we find). Call (415) 572-7341 or (800) 227-8365 between the hours of 8:30 a.m. and 5:30 p.m., Pacific time, Monday through Friday. After 5:30 p.m., our voice mail system will allow you to reach a particular extension if you know either the extension number or the last name of the person you want to reach.

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Facsimile: Our primary editorial facsimile number is (415) 358-1269. The Reviews and Testing fax number is (415) 312-0570. We also have a fax gateway on our electronic

mail system (from which the faxes must be forwarded to the recipient by a human administrator): (415) 358-1270.



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Internet: We have a gateway between our internal mail system and the Internet. When sending a message through the Internet, use the following form:

franzing.jeanne@infoworld.com
We have listed our staff on our editorial and business mastheads in the form that they are listed in our internal mail system, so you can use the mastheads as a guide for sending Internet messages correctly. Please include your full Internet address in the text of your message in case the reply field on your original message gets garbled during transmission, so that we can be certain of replying to your message.

Unfortunately, users of commercial E-mail service cannot use the Internet to send messages to users of other commercial E-mail service, so customers of AT&T Mail (Easylink), CompuServe, and other commercial mail services cannot send messages to mcmil@mail.com.

MCI Mail: We have also provided all of our editorial staff with accounts on MCI Mail.

Our gateway delivers MCI Mail to our local mailboxes. All of these addresses appear in MCI Mail's interactive directory. You may also send to one of these accounts through a gateway by concatenating the first initial(s) with the last name of anyone in the editorial masthead. (For example, Rachel Parker is rparker@mci.com.)

AppleLink: We have provided some of our editorial staff with personal accounts on AppleLink, including Stewart Alsop (ALSOP), Anne Kalczak (KALZAK), Bob Kayne (KAYNE), Kristen Krueger (KRUER), Lia Lorenzano (LIAL), Tracy McGee (MCGEE), and Tom Quinlan (QUINLAN).

CompuServe: *InfoWorld* has a single account, which is collected at least once a day, for receiving letters to the editor and other comments.

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>MCMail:address
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For example, to reach Rachel Parker:
>MCMail:rparker
>rachet.parker@infoworld.com



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ENTERPRISE COMPUTING

Software licensing

BY PAUL KORZENIOWSKI

LAN managers face a delicate balancing act

What's the most pressing problem facing LAN administrators today? Lack of trained personnel? The dearth of comprehensive management tools? Immaturity of current software products? All good guesses, but all wrong.

The biggest headache and the most emotion-charged issue is software licensing. The relatively simple task of paying for software that a company uses is causing the hair on many LAN administrators' heads to turn gray. "I would characterize problems arising from software licensing as overwhelming, and I chose that word carefully, not cavalierly," says Eugene Friedman, vice president of applied technology at Chase Manhattan Bank Inc., in New York.

The task may be daunting, but help is on the way. Awareness of licensing problems is increasing. Ad hoc and de facto standards groups are trying to solve the myriad of problems. Major software companies, such as Microsoft Corp. and Novell Inc., are adding license metering software to their product lines and publishing application programming interfaces (APIs) so third-party products can take advantage of these capabilities as well.

But despite these moves to a saner, better-organized environment for license management, problems will likely remain for at least a few more years because, quite frankly, licensing is a complex issue.

ANTIQUATED POLICIES ABOUND. Antiquated licensing policies now in place could prove difficult to change. Vendors' terms and policies lack consistency. The technology needed to make licensing simple is immature. To top it all off, vendors and various groups are working in vacuums.

There may be debate over whether—and how soon—solutions will arrive, but everyone agrees that there is a problem. "During the past few years, software licensing has become a major headache for many large companies," says David Passmore, vice president of the Gartner Group Inc., a Stamford, Conn., market research firm.

Pinningpoint the source of the problem is relatively simple. "Network technology has moved faster than software licensing policies or technology," says Priscilla Tate, a member of the Microcomputer Manager's Association, in New York, and president of Technology Forum Inc., a New York consulting firm.

Many current licensing agreements are based on non-network technology and are no longer appropriate. In the old days, software ran on large mainframe computers, which cost millions of dollars. Consequently, software was complex and expensive. Companies paid for one package that ran on one mainframe, and users lacked the ability to freely copy software. Now, advent of PCs brought new views into the equation. Applications ran on small computers that cost only thousands



of dollars. Suppliers discovered that users were willing to pay only a few hundred dollars for software.

Five years ago, copy protection was a major issue. Suppliers wanted to use the technology to ensure that users paid for whatever they used. Users found that copy protection was cumbersome. Disk problems would transform a user into a nonfunctioning employee because he or she did not have a backup copy of an application. Corporations pressured suppliers to loosen copying restrictions.

Now, users can easily copy software. In some cases, copying seems appropriate. For instance, a user may want to make an extra copy so he can take it home and work on his home PC. In other cases, copying is illegitimate: A user duplicates software for a colleague who simply doesn't feel like paying for the program.

CONCURRENT LICENSING. The rapid assimilation of LANs exacerbated licensing issues. With stand-alone packages, software ran either on a mainframe or on a PC, so it was simple to understand why

each user should pay for a copy of a program.

With LANs, suitable compensation became debatable. A few years ago, suppliers mandated that companies purchase an application for each of their users—a corporation with 100 users had to purchase 100 software licenses.

Many companies felt ripped off: They paid for 100 licenses but often used only 25 copies. Large corporations pressured software suppliers to change their policies, and a new form of licensing, concurrent licensing, evolved. In this scenario, a company pays only for the maximum number of users accessing the application on the LAN at a given time. As a result, the 100-user company mentioned earlier only has to purchase a 25-user license.

Licensing has been a give-and-take between users and suppliers, with each step forward causing another problem. Shortly after giving users the ability to copy software, suppliers began to search for ways to protect their investments. The Software Publishers Association (SPA), a Washington-based vendor consortium

that looks after software developers' interests, tallied up its score sheet and determined that software companies were losing \$6 billion per year because of illegal copying. The organization cracked down by hauling the criminals into court in a series of celebrated cases.

In the fall of 1990, the Microcomputer Manager's Association (MMA), which was founded in 1982 to protect users' interests and is composed primarily of PC and LAN administrators, responded. The group, which is based in New York and has chapters throughout the United States, contended that many problems arose because of outdated licensing policies. "Ninety-nine point nine percent of corporations want to fairly compensate vendors for software; the potential downside of illegally copying software is much greater than any possible savings," says Technology Forum's Tate. "The MMA wanted to shift attention away from illegal copying to more substantive issues, such as practical licensing policies and tools."

In the fall of 1991, the group issued a white paper outlining software licensing issues. The document listed the different ways software suppliers could package their wares. The paper pointed out that software policies were inconsistent and created administrative problems. The document also listed steps companies could take to educate users about potential problems.

In the spring of 1992, a second user consortium sprung up. The Open User Recommended Solutions (OURS) group was formed to address issues raised by multivendor computing. In the fall of 1992, the group assigned a special interest group to outline software licensing problems.

KEEPING PACE WITH CHANGE. In January, the group delivered its document. Like the MMA, OURS stated that software licensing practices had not kept pace with technology. The group outlined a series of problem areas that large companies found disconcerting:

1. International companies had trouble instituting worldwide purchasing plans because software policies and licenses varied from country to country.
2. Downsizing created pricing problems. Companies wanted credit when they moved from expensive mainframe software to a Unix or PC version of the package, but few suppliers offered that option.
3. Maintenance should be included as a standard part of all licensing agreements.
4. Suppliers should offer companies a range of licensing options because no single plan meets all user requirements.

The document included a glossary of standard licensing terms. "In order to address licensing problems, users and vendors have to work with a consistent vocabulary," says Chase Manhattan Bank's Friedman, who serves as co-chair of the OURS licensing committee. "We don't think everyone will

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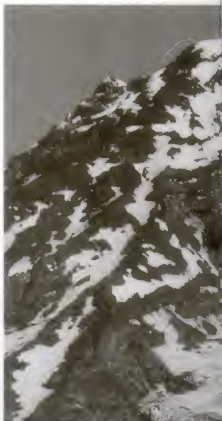
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Gray levels:	91	51
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Ethernet:	Built in	Optional
RAM:	8MB	6MB

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LAN administrators want to:

- Easily control software licensing
- Make informed decisions about software usage
- Automate software procurement
- Simplify license compliance in large environments

SOURCE: NOVELL INC.

agree with our terms, but we wanted to stimulate discussion that could eventually lead to more consistency."

Carving out a consistent set of terms solves only one aspect of the multifaceted licensing problem. Users need tools to track and manage copies of applications. "The industry is undergoing a fundamental shift in emphasis from the right to copy software to the right to use it," says David Zwicker, vice president of marketing at Gradient Technologies Inc., in Hudson, Mass. "In order for that to occur, corporations need tools to manage software licensing."

A few companies, including Gradient, have built such products, which are called license managers. A license manager stores copies of an application on a LAN server along with lists of certified users. Users enter a string of data that includes a security code, and the server releases a copy of the software to the user. When the user has finished working with the application, he or she sends it back to the server.

Currently, use of license managers is limited. The bulk of available products are found in the Unix arena, and even there they seem immature. For instance, the department of engineering at University of Dayton, in Ohio, operates a series of LANs with more than 150 users connected to a series of LANs running TCP/IP. Tom Davis, a system network manager at the department, says the department uses Sun Microsystems Inc. Sparcstations as servers and PCs running SunSoft's Interactive Unix and Microsoft Windows as clients.

Davis has two products that track software licenses: the Network Licensing System, which was jointly developed by Gradient and Hewlett-Packard Co., in Cupertino, Calif., and FlexLM, which comes from Highland Software Inc. of Palo Alto, Calif. The products offer Davis some help but fall short of his desire, which is one package that controls all licenses. He notes that each application still requires its own license manager and often he has to use two license managers if an application runs on more than one LAN. Also, there is no integration between the Gradient and Highland packages. Neither product meets all his expectations for tracking maintenance agreement renewals.

STANDARD APIS NEEDED. Standards could solve some of these problems, and various standards bodies are attacking the issue. In the spring of 1990, the Open Software Foundation (OSF), a vendor consortium in Cambridge, Mass., began to outline a set of network and system management specifications dubbed the Distributed Management Environment (DME). The OSF issued requests for proposals for various parts of the specifications, which were broad. Suppliers then

vied to have their technology selected as key components of the system.

In the fall of 1991, the OSF made its selection. The DME foundation was based on technology from HP and Tivoli Systems Inc., an object-oriented systems management supplier in Austin, Texas. In addition, the OSF opted for a number of add-on modules, such as network backup and licensing, and selected the Network Licensing System as its core licensing component.

Once the technologies were selected, the OSF had to weave them together into coherent systems supporting common APIs. This task has turned out to be quite tedious: The OSF has pushed back delivery of the HP and Tivoli products from the summer of 1993 to the first quarter of 1994.

Rather than simply sit and wait for those products, the organization opted to deliver some add-on applications including the licensing component. Garry Bear, the DME technology manager at OSF, says the licensing component should be available during the fall of 1992, and vendor-compliant products should appear by year end.

In addition to the OSF endorsement, Unix Systems Laboratories Inc., bought by Novell in December, adopted the Net-

work License System as part of the Atlas software architecture. X/Open Ltd., a European standards-setting consortium, is examining the Network License System as the foundation for its evolving license management standards.

For the most part, these license management technologies will be applied primarily in the Unix environment.

The problem is most corporate environments is that IS managers are dealing with multiple platforms, and desktop users are accessing applications that run on a variety of computer systems.

What's needed is a license management technology that spans users' multiple platforms. Richard Mirabella, president of Market Technologist Inc., a Palo Alto, Calif., consulting firm specializing in software licensing, says, "Software licensing is a new issue to PC users and LAN administrators."

So one finds that PC vendors' approaches are scattershot, with most applications relying on proprietary licensing schemes. Consequently, users have to manage each application's licenses separately and, in some cases, haphazardly. "Historically, we had our end-users manage their own software licenses," notes Joel Richmond, a PC Coordinator at GE Aerospace Inc., in Burlington, Mass.

Now we're trying to outline standards and identify products so monitoring can be centrally controlled. The issue has become too complicated and too important for us to rely on our old method."

NETWORK LICENSE SERVER. Consistency is beginning to emerge in the PC licensing area. In February 1993, Novell and

Gradient announced plans to develop a version of the Network License System that runs on NetWare LANs. The product should be available during the fourth quarter of this year, says Bob Young, Novell marketing director with the network products division in Provo, Utah. However, pricing of the software has not been determined. Two options are under consideration, Young says: license management as a standard component of the NetWare operating system, or as an add-on package — a NetWare Loadable Module (NLM) in all likelihood. The product is also expected to be renamed the NetWare License Server, which will include a published API that third-party application makers can write to in order to take advantage of the license metering service.

In addition to server software, standards are needed for PC client software. "A number of suppliers make back-end licensing servers, and we see a need for a standard interface so applications can 'license enable' themselves to work with those products," says Michael Fritz, a group manager at Microsoft.

Microsoft, working in collaboration with 20 PC industry vendors, has developed the License Service Application Programming Interface, which it hopes to promote as a de facto industry standard (see sidebar). The API will be used between the Windows operating system and Windows applications.

PROGRESS. Even though there is a lot of activity in the licensing area, various groups are not exchanging information: OURS representative Friedman had not read the MMA's white paper, and MMA's Tate was unfamiliar with OURS.

Vendor competition is another issue. "Software vendors view licensing as a key way to differentiate their products, so I don't think there is a need to rigidly define licensing agreements," said Ken Walsh, the executive director of the SPA.

Not all suppliers agree with that statement. "We don't think licensing is an area where vendors should compete, and [we] see better ways of differentiating our products, such as delivering them on a number of different platforms," says Steve Watson, the vice president of market relations at Software AG of North America Inc. in Reston, Va.

Software AG plans to revamp its licensing policies and software products so they conform to the OURS specifications by next year.

Such statements encourage Chase Manhattan's Friedman. "In the one year that I've worked on this issue, I've seen a great deal of progress as we see solutions beginning to appear," he says.

But users should be cautious about how quickly the solutions will be adopted. "The industry is now in an educational phase where vendors and users are trying to clearly understand licensing issues," says Anthony Picardi, author of the book *Software Licensing and the Industry Analyst* with International Data Corp., a Framingham, Mass., market research firm. "A year or so will pass before all the issues come clearly into focus. A couple of years will pass before there is a widespread number of products that address them. To some, licensing seems like a trivial task. Once [you] take a close look at it, [you] see just how complicated a problem it is."

Paul Korzeniowski is a Malden, Mass., freelance writer specializing in LAN computing issues.

Microsoft offers License Service API to the PC industry

Microsoft, along with 20 other computer vendors, is working to launch the License Service Application Programming Interface (LSAPI) as a de facto industry standard. Those other companies include Apple Computer Inc., Banyan Systems Inc., Digital Equipment Corp., Lotus Development Corp., Oracle Corp., and WordPerfect Corp.

As we've seen in the recent past, Microsoft and de facto APIs can be a volatile mixture. LSAPI is engineering its share of industry comment and criticism. On two other occasions, Microsoft's attempts to define standard interfaces for the PC industry have been met with vitriolic responses — namely its electronic mail API (MAPI) and its database interface — Open Database Connectivity (ODBC).

To date, the LSAPI specification has been completed and released, although it hasn't found its way into any commercially available products.

Michael Fritz, a Microsoft group manager, anticipates LSAPI-compliant wares will begin appearing in the market in the next 12 months.

Microsoft plans to include LSAPI in Windows and Windows NT but not in versions of those products that will ship this year, according to Fritz.

Microsoft will also include license management technology in the as-yet-unannounced Hermes product — a system management tool that distributes and tracks software across a network

and controls licensed software's use.

Richard Mirabella, Market Technologist president, says LSAPI will offer only limited help because it consists of only the most basic licensing functions.

"LSAPI outlines a handful of commands compared to more than 30 available with many [commercially available] license manager packages," he says.

Mirabella, who served on the LSAPI committee, says vendors could not agree on standard commands and omitted these features, allowing individual implementers to adopt their own extensions to the specification.

The extensions will severely limit the level of compatibility between different vendors' products," he says.

Microsoft's Fritz countered that the first release was designed to get the standards-making process rolling, and eventually LSAPI will be enhanced to include more commands. In addition, Microsoft is trying to adopt some of the work done in non-PC area to foster more consistency among all types of licensing technologies.

Disagreement about LSAPI is one of a handful of areas that could slow down early progress in the license management arena. Dissection could mean solutions are arrived slowly rather than quickly.

LAN administrators are hoping that vendors put aside their marketing wars and offer technology that moves the industry forward.



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ENTERPRISE COMPUTING / MANAGEMENT

Involve end-users in computer training design

A more computer-literate and productive work force is just one of the many benefits

BY TORI COWARD

This is the first of a two-part series.

The best-laid application development plans can go awry if users fail to utilize new software deployed by the IS department. Millions of development dollars are wasted each year when systems are underutilized by users who don't understand how they work.

The problem almost always stems from inadequate user training, yet few IS departments pay much attention to training issues.

Training is important. Without adequate instruction, even motivated users will spend more time typing up technical support people with questions that could have been more efficiently addressed in a training class.

The blame for inadequate training falls squarely on the IS department. Often, IS personnel are unfamiliar with the business uses of new computer technology and misjudge the things end-users need to know. The result is misdirected and inadequate training. Often, this is due to poor scheduling or budgetary constraints.

Training is frequently neglected until the final phase of the project. In many organizations, training is given either lip service or no attention at all. These outfits wait for the user "noise level" to escalate before taking action.

FIRST STEPS. So just how do you develop training programs that will help users?

For starters, involve them in the process. When users participate in developing computer curricula, they gain a better understanding of the new system and feel like they're part of the project. In addition, they can help developers detect more application problems earlier and provide constructive design advice.

Getting user input into the training effort may seem simplistic and obvious, but it's surprising how many IS departments spend big bucks and lots of time getting users involved in system design but then fail to include them in the development



G. DOWEN / INFO WORLD

of the training program.

The best approach is a thorough needs analysis. Develop specific questions for users. Ask them what they hope to get out of the training. Questions should address work-related tasks, not product features. For example, don't ask users if they want to learn database query languages; ask them how they want to search for particular types of information. Surveys and interviews are good ways to take the pulse of your user community. Talk with key users to find out what they do during an average day.

Surveys are useful but limited, and often only a small percentage of those polled will respond. One-on-one interviews take the most time but yield the most candid responses. Focus groups may help engender a sense of community among the attendees and spark new ideas.

Whether you interview users or send out a survey sheet, it's critical to get a comprehensive look at how users perform their jobs and how they will use the system. When I developed a custom training program for a major brewing company, I discovered that the training program they had in place spent only a few hours of a four-day session on printing issues. Yet more than half the calls to tech support were for printing prob-

lems. I added a more in-depth discussion of printing issues and problems in the class and training material.

It's important to realize that users might not know what they want or how to ask for information they need. Simply listing application features, for example, may not help because users won't understand, for instance, what a table is or how to use it.

ASK THE MANAGERS. In addition to polling end-users, it's essential you talk to their management. You may find additional goals beyond those identified by users or hidden objectives that hinge on a business mission not known to users. A company may want its employees trained on a new system because a pending reorganization will change departmental responsibilities.

Of course, for interviews of users and their managers to be effective, you will have to target the right people. You will want to include subject-matter experts and department representatives, as well as some of the resistant "users from hell." Not only can you expect honest criticism, but once converted they can be your most enthusiastic promoters. Other users I specifically seek out during training development are people who loved the old system and don't want to use the new one, people who are using both, and people who switched and are using the new one extensively. I ask each person what was difficult to learn and what they liked, loved, found confusing, and used a lot.

Managers can also pinpoint advanced users who, with extra training, can provide first-line support for a department.

Anything the information systems department can do to make training more relevant to the students will make you as an IS manager more effective. No one

knows their jobs and their environment as well as users. They can tell you, "This is important. Stress this more."

Training materials have to address relevant topics to be effective. Abstract or generic examples are not easy to remember. Too often, courses fail to address the issues that are really important to users, or the examples included are irrelevant to the business. One good way to make topics relevant is to use actual work or business documents. If confidentiality is a concern, simply black out any proprietary names or numbers.

Good, relevant examples are critical. Training professionals often recount stories of classes that used examples like mortgage worksheets to illustrate the features of a spreadsheet. Unfortunately, students often fail to make the connection between the example and their work and don't realize the spreadsheet can be used for other tasks as well.

BE PROACTIVE. Training gets more difficult when the system is poorly designed or has a clumsy interface. Many legacy systems, after enduring years of modifications by dozens of programmers, use inconsistent commands and keys.

The best approach in this situation is to determine the problem areas early on and develop special materials (such as handouts, templates, or references) to address them. Keep in mind that these inconsistencies can be major productivity downers and a source of user frustration.

Confusion can also result when new systems are introduced as business procedures are changing. Training on new systems must also include a significant amount of selling to get users to adopt new procedures or work habits. In fact, training may be these users' first encounter with the new users.

While users may be eager to use a new application that makes their jobs easier, they may be skeptical or reluctant when it comes to corporate directives.

DRESS REHEARSAL. Once your course is developed, it's time to take it through a dry run. Pilot programs are an excellent way to spot problems before turning the training session loose on the company at large. I like to include three kinds of people in pilot courses: those knowledgeable in the system (to point out any errors or missing points); one or two people with training backgrounds (to evaluate the presentation); and some typical users.

Although it's always good to incorporate user feedback, it's possible to go too far. A lumber company in the Carolinas went to extremes to meet user requests, only to have it backfire after trying to incorporate conflicting user demands. And don't rely too heavily on feedback from a single department or area. The result may be a course that is too customized or specific to the single group of users to be useful to the wider corporate community.

Tori Coward is president of Tangent Computer Resources, a Dallas computer training company.

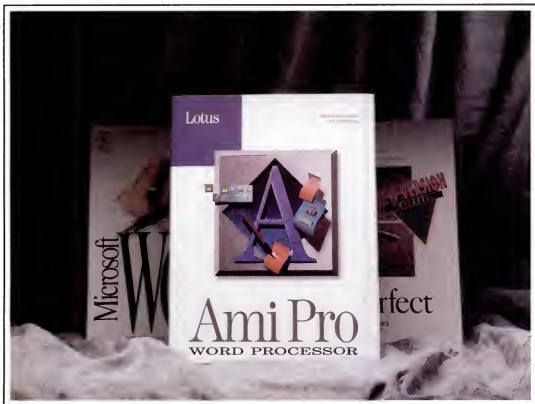
User-driven computer training

- Understand management objectives for training.
- Gear training materials to users' work environment.
- Use interviews, surveys, and focus groups to better understand users' objectives.
- Don't wait until a new system is installed to develop a training program.
- Get resistant users involved; once converted they can be important promoters.

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Lotus Ami Pro captured the 1992 PC Computing MVP Award. (12/92) (Note: The MVP award also appears in the new WordPerfect ad. That's last year's award.)

PC Magazine recently named Ami Pro one of the Best Products of 1992. They said, "No other product can match...the sheer pleasure of using it." Microsoft Word received an Honorable Mention, with the comment "...it's a step behind Ami Pro." (1/93)

Now, perhaps the battle royale between Word and WordPerfect has been put into perspective.

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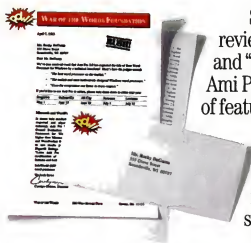
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Case Study

Workflow tool improves bank's customer service

E-mail alone just wasn't enough to ensure high worker productivity at Bankers Trust

BY ALICE LAPLANTE

Can middleware and a workflow approach to application processing instill workers with a sense of responsibility and customer service? The answer is yes at Bankers Trust Co., a large New York financial institution.

Using a middleware program that links Lotus Notes to SQL databases, Bankers Trust created a method to ensure that customer requests are answered in a timely and accurate manner. Whether they come by telephone, fax, or E-mail, customer queries are routed to the appropriate person, who has a predetermined period of time in which to respond. If that person doesn't reply, the query is "escalated" until someone does.

The problem that necessitated this new approach to business is faced by many corporations. Although every firm wants to pay more attention to customer service, it's nonetheless hard to get workers to take personal responsibility for individual clients.

"Quite often, the employee answering the telephone or dealing with the client doesn't have access to the right information or the power to take the desired action," says David Osborne, vice president of technology for the Bankers Trust retirement division.

Prior to the installation of the new system, a customer request might be sent off to the appropriate employee using one of many custom-built Notes applications. For example, a team of financial analysts might be required to track each other's institutional buy and sell activities using a

Notes bulletin board—yet, all too often, nothing happened.

WORKFLOW ROUTING. Osborne thought some form of workflow automation might be the answer. He'd worked enough with Notes and workgroup computing concepts to recognize the possibilities. But he also knew that simply passing messages from one employee's E-mail to another's clearly wouldn't do.

The critical issue was timing. "We needed an automated way to escalate client requests and route them to other employees if someone didn't act within a reasonable amount of time," he says. His experience with Notes initially led him in the direction of a Notes add-on, but he was discouraged by the price.

"I got an estimate from a Notes consultant, who told me [he could write an application] in C using the Notes API. It would take 50-plus working days to deliver and cost \$50,000," says Osborne. "That was clearly too long and too expensive."

Then Osborne remembered hearing about InfoPump from Channel Computing Inc., the maker of Forest & Trees. "We're not big Forest & Trees users here at the bank, but Channel had visited a number of times, and during one of their visits demonstrated an InfoPump prototype. We thought it might solve our problem," he says. So he called Channel, which sent a technical worker to New York. Within two days, a working prototype was operational. "We had a few glitches, but basically it was running," Osborne says.

Channel calls InfoPump a "middleware

Bankers Trust gives IS autonomy to each of its business units

Bankers Trust's workflow project illustrates what's possible once a solid architectural foundation has been laid.

On the forefront of the client/server movement since the mid-1980s, Bankers was an early adopter of Microsoft Windows and Lotus Notes.

Since 1990, the company has been blazing trails by giving business units greater autonomy and control over their computer systems. A corporate-wide directive called for the migration to client/server systems for all new mission-critical applications. This resulted in a decentralized approach to system development.

Prior to this move the bank embraced a traditional "glass house" approach to IS. All purchases and application development decisions were made centrally.

But five years ago, the company de-

cided this wasn't working. Application developers were too isolated from the business units and IS priorities didn't reflect business needs. Requests for new applications took forever to complete.

Bankers responded by breaking its IS group apart. Now each business unit has its own IS group. IS workers report directly to the head of the division. The success of the system is tied to the profit and loss of the business.

To ensure corporatewide interoperability, Bankers retains a small central IS group to set architectural standards, approve major development projects, handle purchasing, and negotiate vendor contracts.

The business divisions are happy to have autonomy over system decisions and willingly cooperate with central IS to set corporate standards, Osborne says.

data router." It's server-based software that moves data between all major back-end databases and Windows-based front-end applications while automatically performing any necessary formatting.

The program has four primary components: a Windows development environment that generates and debugs data transformation scripts; a "pump" to process the scripts either on demand or according to a predetermined schedule; a database to store processing information, execution logs, and error logs; and a database interface to establish connections to

disparate data formats such as Lotus Notes, SQL databases such as Oracle and Informix, and even proprietary host databases.

The "timing" capability in InfoPump proved essential. The status of any particular transaction can be checked at any given time interval. If it doesn't answer a query in a set period of time, InfoPump routes it to the next person.

Now when a Bankers Trust client calls with a question or a request for a transaction that can't be taken care of on the spot, the employee taking the call or receiving the fax logs the request in a Visual Basic application. The transaction is classified according to type, sent to a SQL Server database on the NetWare LAN, and entered into the InfoPump "queue."

Every 15 minutes InfoPump checks the queue to see if anything requires attention. When it sees an entry, it does a lookup of the transaction type and automatically routes the transaction to the first employee name on a prescribed list. Notes is then activated, and the information is sent via E-mail to the employee.

The worker gets an audio beep that signifies an item requires his or her attention. "That employee knows he or she has a certain amount of time—again, this is prescribed into the application according to transaction type—to respond. If the transaction is completed, InfoPump records that fact in the log." But if the transaction is not completed, InfoPump will then automatically route it to the next employee on the list.

Not only was this application up and running in a very short period of time, but the cost was significantly lower: \$25,000 for the software and \$2,500 for two days worth of consultant time, Osborne says. "This saved us a lot of time and a lot of money."

InfoPump helps Bankers Trust answer customer requests in a timely, accurate manner.

Bankers Trust 'escalates' customer response

Who: David Osborne

What: Vice President

Where: Bankers Trust Co., New York

Problem: Despite successful groupware and E-mail applications designed to facilitate communication among Bankers Trust analysts, critical client requests for financial transactions and account information were falling between the cracks.

Solution: Using Lotus Notes and Channel Computing's InfoPump middleware, all client inquiries are logged into a Notes database and automatically routed by subject classification to the appropriate employee. If the client isn't sent a response within a specified period of time, the request is "escalated" until the matter is resolved.

Cost: \$27,500

Most surprising lesson learned: News spreads like wildfire when a new application solves a formerly insurmountable business problem.

Quote: "I've worked in technology at Bankers Trust for almost five years, and I'm astonished at the great application uses people throughout the company are coming up with."



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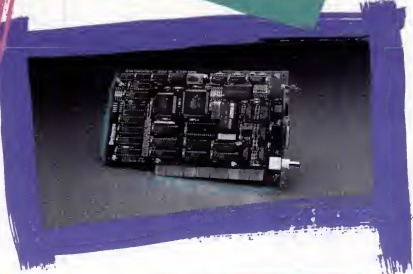


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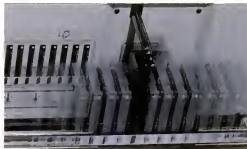


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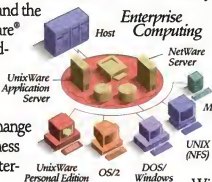
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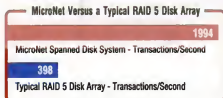
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The death has been greatly exaggerated of DOS

DOS is still the preferred operating system on over 80% of the PCs in Fortune 1000 companies, according to recent studies.

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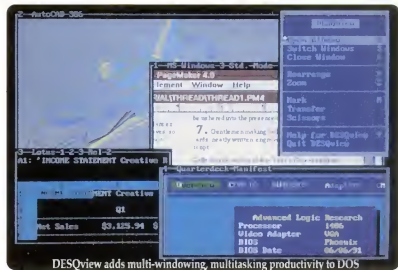
Many Fortune 1000 companies are using DESQview™ as the best solution for keeping the dependability and familiarity of DOS programs and adding multitasking, windowing productivity. DESQview users give up nothing—since it actually runs MS Windows better should users wish to run Windows programs.

As you may know, DESQview 386 has been around for years, evolving into a highly efficient multitasking, windowing environment that extends the power of DOS, giving you increased productivity while conserving precious memory and disk space. In fact, the vast majority of 386 and 486 PCs need no additional memory or disk space to run DESQview.

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Windows programs side-by-side.

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* DESQview makes multitasking and windowing available to users of 286-class machines with similar memory efficiencies through QEMM 50/60 for IBM™ PS/2 90 and 60 users and QRAM for other 286 users.

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Down to the Wire / Nicholas Petreley, Nancy Durlster, Laura Wonnacott

Unlike Energizer bunny, E-mail glitches caused us to run out of steam

After two attempts to integrate dissimilar E-mail products, first via an X.400 backbone, now using Novell Inc.'s Message Handling Service, we confess that we're at a loss as to why so many vendors, particularly gateway makers, are having so much trouble getting it right.

What could be so difficult about maintaining the message priority setting across E-mail systems? It seems like a pretty simple task, but few gateways consistently get it right. Aren't we just talking about reading and writing files here? Sure, you have to shift around some information in order to suit the E-mail package on the sending and receiving end, but if both message formats are clearly defined, this should be a piece of cake, shouldn't it? Either we're completely ignorant about the scope of this problem, or we're looking at the greatest examples of programming underachievement since DOS' Edin. Check out the disappointing results in the E-mail interoperability comparison in this issue, on page 68.

KEEP TEM COMING. If our scoring in this comparison included a category called effort, Futurus Team would certainly take the top prize. Futurus was very responsive to our problem reports. They did everything in their power to keep new and improved products flowing into our hot little hands. In fact, we got so many versions and fixes during this test period, the banks in Atlanta are changing their signs to read Time, Temperature, and Current Update of Futurus Team. When all was said and done, the final tally included two significant versions and two additional update diskettes (there was a third unsolicited update in there somewhere which we didn't use), all within the span of about six weeks. And



then, after all that, we got the latest manual a week after the most recent update arrived. The manual that shipped in the box with the disks didn't document all the features, and most of the entries in the index pointed to the wrong pages.

The updates arrived at fever pitch during our X.400 interoperability comparison, too. We lost track after a while, but it was on the order of one initial package, at least two shrink-wrapped updates, and an interim update here and there. We hope you, dear reader, are getting this kind of personal attention as well.

CABBAGE PATCH DOLLS. Or maybe you won't need it. According to Futurus, our fax and phone conversations with public relations folks and technical support were spent trying to pin down problems that only seemed to be happening at *InfoWorld*. "None of these things was reported by their users or beta testers. Not even the pull-down menu where two of the menu choices are selected using the same accelerator key (select R for Rename, or R for Refresh All). Actually, it is possible that nobody else has experienced the same problems we have. With so many

interim updates of Futurus Team floating around, there's a good chance no two installations are alike.

When they get it right, they'll be able to boast about their installation. If we had started with the latest product, Futurus Team would have been the easiest product to install. Setting up local users was a cinch, too. It was strictly the update process that iced the warm fuzzies.

First of all, when we upgraded to Version 2.1, the old icons weren't removed from the Futurus Team program group in Windows. No big deal, we could delete them manually. More puzzling, though, was the fact that we received an "FTRIV ER missing" message as soon as we started Windows. We scanned the more than 21 entries in the known bug list included in the README file. Nothing. We figured we'd somehow accidentally deleted the file. So we found the file it was looking for on one of the disks and copied it to the FTRIV directory.

Big mistake. Everything seemed fine at first, but occasionally we would get an endless stream of pop-up error messages when we started Windows. Fortunately, with so many error dialog boxes being opened at once, Windows would quickly run out of resources and turn control back over to us long enough to exit. As a side effect, one of the Futurus Team initialization files was corrupted each time this error occurred.

AND IF YOU SNEEZE. It took us a while, but we tracked down the cause-and-effect relationship. First, you have to load a DOS TSR before you can use Futurus Team for Windows (hey, guys, write a Windows DLL or driver or something, OK?). If mail is waiting when you load the TSR but you don't read it or cancel the unread status (and it's Tuesday, and

the moon is full, and you know someone named Bob), the endless error pop-up problem occurs when you start Windows.

In the end, it turned out to be a wild goose chase caused by our misguided attempt to fix the "FTRIV ER missing" error. This driver file is no longer needed in the new version of Futurus Team. The installation program correctly deleted the old file (which is why it was missing) but did not edit the WIN.INI file to remove the command to load the driver, hence the "FTRIV ER missing" message when Windows was initialized. Once we deleted the driver and edited the WIN.INI file manually (and recreated the corrupted TEAM.INI file), the errors disappeared.

Because these and other problems were "only occurring at *InfoWorld*," and because they started only after installing the second...no, the first...no, wait...well, some update or other, we decided that we would have to start from scratch again to give Futurus a fair shake. We pulled out all the disks and reinstalled everything, from initial version to final update, this time carefully following instructions to the last jot and tittle.

The installation program still didn't remove the WIN.INI instruction to load FTRIV ER, nor did it delete the old icons. Futurus promised a smarter installation program in some future update, but unlike the Energizer bunny, we finally ran out of steam, not to mention time. The *InfoWorld* beta test center had to close its doors on this one and move on.

There's actually a lot to like about Futurus Team once you get past the minor glitches. It's still rough around the edges, but we like the chat feature, fax options, and the groupware capabilities.

We're just not sure which version to recommend.

Next week we'll explore the "simplicity" of OS/2 database setups.

Help Desk / Brett Glass

PCs with fast CPUs can give some tape backup drivers fits

I've been trying to add Archive 9250 tape drive to several of our company's 486DX2/66 VESA Local Bus systems. Backups complete with no error messages, but when I try to restore, I get an error message: "File set damaged." The tapes cannot be read on other systems. I've tried several combinations of system settings, including ISA bus speeds, wait states, disabling the cache, and disabling shadow RAM; nothing works. Any ideas on how to fix this problem?

Gary T. McCasill

When I upgraded to an OverDrive Achip, I had a similar problem: My Mountain FileSafe 8000 tape drive would no longer work with Talgriss' FileSecure tape backup program. The problem turned out to be a bug in the software: It wasn't written to expect a CPU that fast. I solved the problem by reverting to Mountain's software, which was less sensitive to CPU speed.

When I called technical support for Archive/Maynard/Irwin (they're all one company owned by Conner Peripherals

now), a technician agreed that Archive's software had a similar bug but had no idea when (or if) the company planned to fix it. Fortunately, the 9250 is a QIC-80 drive that conforms to the QIC-117 interface standard. Thus, you may be able to substitute Symantec's Norton Backup software, which is compatible with most drives of this type. (Norton hasn't tested this specific drive, though.) Another possible fix: Archive's high-speed controller card, model 20001, which retails for \$150. This card, which bypasses the usual floppy disk controller interface, may eliminate the timing problems.

For me, the problem was that the files were an actual power failure. Imagine if you were relying on those backups following a real disaster.

I have an old 25-MHz 386 motherboard. When I try to load DOS' HMEMSYS utility, I get the message "Error reading A20 line." What is wrong?

Jeffrey Cohen

HMEMSYS is having trouble identifying your hardware. To get around this problem, try using the MACHINE:XX switch on HMEM's command line, re-

placing the XX with a number from 1 to 16. Keep a plain boot floppy handy in case this causes the machine to lock up. You might also want to try a third-party memory management program, such as Memory Commander, NetRoom, 386-Max, or QEMM.

In your March 22 column in *InfoWorld*, you advised Carl Carr that any standard motherboard will fit his computer. This is true of the majority of AT clones, but some of AST's machines do not use standard motherboards.

Carl's best bet is to buy one of the special 386SX and 386DX upgrade cards marketed specifically for the AST Premium 286. These are available from AST itself, from Kingston Technology, in Fountain Valley, Calif. (714) 435-2600, and SuperComputers of Redmond, Wash. (206) 881-7500. All of these upgrades cost more than a new 386SX PC.

Carroll Lloyd

Mea culpa; several readers have blamed to report that the AST Premium 286—unlike the other AST computers I've upgraded—uses a very nonstandard motherboard and case. Because the Premium

has seven slots, a front-mounted keyboard connector, and serial and parallel ports in odd places, you can't just swap boards on this model. Therefore, it may be best to sell the old system or use it as a file or print server.

I need to contact the authors of Still River Shell, a shareware file manager that entered the market in 1985. The program lists Bill White and Bob Dye as the authors, but the phone number given in the documentation no longer works. Is this utility still being marketed?

Mario Pigna

I've heard great things about the Still River Shell, whose file management display resembles those of QDOS and LapLink. If you have information about the status of this program (or the authors), please call or send E-mail.

Brett Glass' Help Desk answers readers' business computing questions. Brett can't answer questions personally. Readers can leave questions by calling (800) 227-8365, Ext. 702 or by messaging ComputerServe (72667, 3673) or on the Internet at brett_glass@infoworld.com.



Civilized Computing / Cheryl Currid

Fax distracts — develop effective electronic mail strategies

Frustrated about fax? You are in good company. David Strom's personal follies with PC fax boards and software (below) are enough to make you think, "Geez, if a guy like David can't make computer-fax combos work, how could anyone else? Maybe we shouldn't even try."

David makes a fuss about fax in his column this week for good reason. I've heard other horror stories about people who valiantly tried and failed to get all the features buttoned down on these products. On the surface, the features provided with fax boards should leave us thinking the technology is fabulous, fantastic. Instead, I've heard other "I" words used to describe the experience.

But Currid has her own view of fighting with fax boards. I have two suggestions about fax: No. 1 will fix the fax follies fast, and No. 2 re-evaluates your corporate dependence on fax.

First, I think somebody should take a look at the whole subject of PC fax boards and figure out what these devices do right and what they do wrong. Then, play to the strengths.

It turns out that most fax boards and software combinations are fabulous for "sending" faxes but fretful on the "receiving" side. My experience and observation shows that most people are happy campers if they stick to sending faxes with fax boards.

As they should be. Most of the PC and LAN fax products, such as Intel's Net SatisFaxtion, are real winners when you want to send out faxes. From just about any application, you simply press print and you can be happily faxing to almost anyone, anywhere. Think of it as a form of wide area remote printing. With the right software and hardware hooked up, you can have your document out on any fax machine on planet Earth.

work to somebody's PC.

So what's the answer? Currid's advice is to buy both a PC fax and a stand-alone fax machine. At the bargain prices you can get today, most companies can easily afford to buy one of each. You can hook up the PC fax board to your local computer or your LAN for sending faxes, and put the stand-alone fax machine up in receive mode. You can even have them share the same phone line if you wish. Is

company using (or abusing) fax for exchanging information that should be sent by electronic mail?" Sheepishly, many will admit they spend more time tooling around with fax than developing effective E-mail strategies.

Even though fax is the de facto standard for many types of corporate communications, it fails to pass Currid's efficiency test for routing information. I wish I had a dollar for each time I saw someone keying in all the information contained in a fax. Whether it was a purchase order, a billing receipt, an interoffice status report, or another business document, people found it necessary to do something other than read and file their faxes.

E-mail, on the other hand, allows people to take the data and put it into the appropriate application smoothly. Many users are quickly learning to become crafty at electronically cutting and pasting information from one place to another. You simply can't do that with fax (even with all the bells and whistles of exotic fax support tools today).

So take some of the time I've just saved you (in step No. 1) and use it to formulate some anti-fax strategies in your company. Rethinking E-mail is a good step.

Fax can be fun or frustrating. Just ask David.

Cheryl Currid, president of Houston-based Currid & Co., focuses on helping clients assess, apply, and organize for new information technology. Her CompuServe address is: 75300,2660.

On the surface, the features provided with fax boards should leave us thinking the technology is fabulous, fantastic. Instead, I've heard other "I" words used to describe the experience.

But receiving faxes is a horse of a different color. It can be a real pain, either in a stand-alone or a LAN environment.

The problem is not a technology failure. Rather, it is our heightened expectation of making fax do more than it can possibly do. After all, fax technology, invented in 1924, was a few generations before PCs (even mainframes) were a gleam in an engineer's eye. The underlying technology was never designed to deal with magic capturing and routing of inbound faxes through wires on a net-

work. This is a Band-Aid solution? Yes, but it's easy to implement and a solution that will work.

After all, how much time should you be spending on developing the consummate fax solution for your office? Well, as unpopular as this may seem, I don't think you should ponder the problem for more than a day. Sure, fax is the universal form of communications for some corporate civilizations, but should it be?

This brings me to Currid's suggestion No. 2: priorities. Ask yourself, "Is my

The Network Curmudgeon / David Strom



This tech lover took a step back and bought a fax machine

I finally broke down this weekend and purchased a fax machine. You see, I've been trying to use computer-based fax products in my consulting business, and I really wanted to stay away from getting a true fax machine if I could. But I couldn't.

What made me do the dirty deed? Simple: reliability. After I lost some faxes to software glitches, I decided enough was enough. It was time to stop being so enamored with technology and get real. When I started my consulting business last December, I wanted to make a statement about actually using the technology that I was going to be writing about. After all, the philosophy worked before when I began *Network Computing* magazine, so why not in my consulting practice?

At the magazine, we used a fax gateway on our Microsoft E-mail system. It stunk. If you wanted to send a fax to an address list of more than 20 people, it would die. It wasn't always able to connect to fax machines in foreign countries. And so forth.

Still, I missed my business with a DOS PC and a fax board. For those times when I needed a hard copy (to sign and return, for example) I arranged to use the fax machine in the music store below my office. (Yes, I could have bought a scanner, but that was more technology than I wanted at the moment.)

I've used five or six different PC-based fax products over the past six years, starting back when there was barely an industry for the products. Back then, no one thought about running them over a network, under OS/2, or on Unix, and packaging dedicated fax servers. My first fax product didn't allow image rotation — when I got my first upside-down fax, I had to turn my monitor on its head.

Times have changed. Some products

edge, I was using Delrina's WinFax Pro, a nice piece of software for Microsoft Windows, and an Intel SatisFaxtion.

WinFax Pro has a fully developed phone book with so many fields that you can actually use it as an address book. It has a really nice feature that adds a menu option to WinWord and other products so that you can directly fax a document from within your word processor.

Back to the case. I was out of the office

He suggested I could take a look at my log, figure out who sent me a fax, and then call and ask them to resend it. Yeah, right, and I could go back to writing these columns by hand, too.

are even beyond 1.0 revs — in some cases, far beyond. CAS, the software specification that was originally developed jointly by DCA and Intel, is now more or less firmly established. Companies have begun to specialize in hardware (such as Gammalink) and software (such as Alcom).

But the curmudgeon in me wants more. I want something as easy to set up and use as a true fax machine, and it's got to be reliable.

Take the case that pushed me over the

for a week. I came home, looked in my fax log, and saw it replete with faxes ready for my viewing. Hot dog, I thought. Now to take a look.

But I couldn't. Turns out that the Intel board and the Delrina product keep their own separate series of logs, and sometimes they get out of sync. When that happens, you have to clear the decks (losing files in the process) and start over.

The nice gentleman at Delrina's tech support was very helpful and didn't seem too fazed by my report. "Oh, this hap-

pens occasionally."

He suggested I could take a look at my log, figure out who sent me a fax, and then call and ask them to resend it. Yeah, right, and I could go back to writing these columns by hand, too.

So off I went to Staples to get my machine — a low-end Sharp for about \$325. At least I won't have any more trips downstairs to the music store to send hard copy faxes.

But I've had second thoughts. After all, I only tried Windows-based products. I didn't even attempt to get a network fax server or try one of the Mac, OS/2, or Unix-based products. What kind of a multipatform networking guy am I?

I called up a few Mac fax vendors. Finding them wasn't easy; I tried searches in Computer Select, going through some back issues of *Mac User* and *Macworld*, and asking friends. No luck. No, I don't mean that their software doesn't work. I never got any calls returned.

I haven't even touched the true networking issues that plague fax today — things such as automatic inbound routing of received faxes, increased network traffic of fax servers, or scanner integration. That's for future columns. Maybe it is time to look at an OS/2- or Unix-based fax server.

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REVIEWS / PRODUCT COMPARISON

MHS connections send 'err' mail

The Enterprise Team tries to connect nine E-mail products using MHS



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When we asked our readers how they would like us to test interoperability of E-mail via a common E-mail backbone, they were most interested in seeing how well an X.400 server would do the job. We tried it with the Retix X.400 Open Server and reported the results of our tests in "What we have here is a failure to communicate." (See October 12, 1992, page 85.) As you might surmise from the title, the results were grim. This time, we tested our readers' second choice — Novell Inc.'s NetWare Message Handling Service (MHS). The results were marginally better but still rather disappointing. Unlike in the last round-up, however, we did find a few reasonably successful connections in the bunch.

We connected nine E-mail products using NetWare MHS, Version 1.5N as the common messaging backbone. We used Beyond Inc.'s BeyondMail, Lotus Development Corp.'s cc:Mail, Da Vinci Systems Corp.'s Da Vinci eMail, Futurus

Corp.'s Team, Microsoft Corp.'s Microsoft Mail for AppleTalk Networks and Microsoft Mail for PC Networks, CE Software Inc.'s QuickMail for the Macintosh, SunSoft Inc.'s Mail Tool (running under the Solaris flavor of Unix), and WordPerfect Corp.'s WordPerfect Office. We ran the Microsoft Windows versions of all the PC-based products.

MHS usually brings to mind installations on local LANs and WANs, but it should not be overlooked because it doesn't have X.400's reputation for connectivity to the world. CompuServe, for example, makes an MHS hub available to its members, and the service can relay MHS messages to the Internet, AT&T Mail, AT&T Easylink, and MCI Mail.

One advantage of using MHS as an E-mail backbone is that a number of PC E-mail programs use MHS natively. Three of our test products — BeyondMail, Da Vinci eMail, and Futurus Team — booked directly into MHS. The rest did not use MHS directly, so we needed six gateways to interconnect all nine products. In our last round of interoperability tests, we connected products via the Retix X.400 backbone. None of the popular E-mail products we tested used X.400 directly, so they all had to be interconnected via gateways to the X.400 server.

Some of the message paths were quite usable, but the overall results were bleak. Of the 162 possible paths a message could take (nine products times 18 possi-

ble one-way paths [nine outgoing, nine incoming]) we found only 14 paths to rate excellent, 18 very good, and 22 good. Contrast that with the 40 paths we found unacceptable, 42 poor, and 26 satisfactory. Clearly, there is still more work to be done.

To our surprise, the native MHS products did not interoperate perfectly with one another. One of the problems is probably a side effect of the MHS specification, which is loose enough to give E-mail vendors enough rope to hang themselves occasionally. Without some coordination between vendors or a tightening of the specification, it will probably be a while before even native MHS products see seamless connectivity.

INTERPRETING THE RESULTS. The final interoperability score represents the average performance of the 18 paths a message could take — outgoing from the product to all nine products tested (including itself) and incoming from all products, as well. Each average interoperability score, therefore, rests upon

many variables — how the originating E-mail program interacts with itself, MHS, six gateways, and eight other E-mail programs.

This is important to keep in mind because, although the score is attached to a single product name, it is not in any way representative of the performance of the E-mail product when used alone.

It is also important to remember that the average interoperability score is composed of message paths you may never consider using at your own site. Consequently, depending on the products you mix and match, the average interoperability you experience could differ greatly on either side of what is indicated by our average scores (for better or worse).

We recommend that you examine our interoperability matrix carefully to get the best idea of how well your installed E-mail programs will communicate with the other products you're considering. Be sure to check both the performance when sending messages to others (reading the chart across) and when receiving messages (reading the chart down).

SPEAK OUT

We've tried a new, more linear visual format in order to accommodate such a large number of products. We'd like your input. Was it easy to compare scores and find the information you need? We'd like to know. Please fax your comments to (415) 358-0570, or send E-mail to nicholas.petrey@infoworld.com. You can also find more instructions in "How to contact InfoWorld," page 52.

How we tested E-mail interoperability via an MHS backbone

Our objective was to interconnect nine E-mail products via a common backbone — Novell Inc.'s NetWare MHS. It is important to note that we were not evaluating the E-mail products themselves, outside of how their design affects their capability to interoperate with other E-mail products via MHS.

MHS is an E-mail engine used natively by three of our test products: BeyondMail, Da Vinci eMail, and Futurus Team. Other E-mail products use it as well, such as NetWork. The rest of the products had to be tied to MHS via gateways.

The current version of MHS, 1.5N, supports two different MHS standards, Standard Message Format (SMF) 64 and SMF 70. SMF 64 has notable limitations. It will only allow a single file attachment per message and limits message size to roughly 8,000 characters. You can connect both SMF 64 and SMF 70 products and gateways to MHS at once.

The gateway we selected used SMF 64: cc:Mail Gateway, WordPerfect MHS Gateway, and Computer Mail Services MHS-SMTG gateway (the vendor indicated that the next version, which supports SMF 70, is about to ship). The WordPerfect gateway was able to circumvent the SMF 64 limitation of one file attachment per message by breaking up outgoing messages with multiple file attachments into separate messages, one per attachment. The cc:Mail gateway did not have this capability. The rest of the gateways were able to use the more recent SMF 70.

We used the cc:Mail Gateway from Lotus Development Corp. to connect cc:Mail, Microsoft Corp.'s Gateway to MHS, Version 3.0 connected Microsoft Mail for PC Networks 3.0. We used the WordPerfect Connection Server, Version 3.1 with WordPerfect MHS Gateway, Version 1.0 to connect WordPerfect Office. We used StarNine's MHS Gateways to connect QuickMail for the Macintosh



E-MAIL

and Microsoft Mail for AppleTalk Networks, and Computer Mail Service's SMTP gateway, S-Bridge, to connect the Sun Sparc 10's Mail Tool. We used the Microsoft Windows versions of the PC-based E-mail products.

The overall performance depended on a varying number of elements: the originating and target E-mail programs, one or more gateways, and MHS itself. Native MHS programs BeyondMail, Da Vinci, and Futurus had a shorter path because no gateway to MHS was required for them to interchange messages. It is interesting to note, however, that even the product based on MHS didn't interoperate perfectly with one another.

SETUP:

For non-MHS products, setup usually involved four steps. First we installed the E-mail product itself, then its gateway to MHS. Then we configured MHS to recognize the added gateway. Finally, we set up the E-mail product's address directory to include addresses to the remote MHS users.

The Macintosh products needed a network connection to the NetWare server running MHS. If your Macs aren't already connected to your NetWare network, prepare for a good deal of additional installation time to set up the proper Apple support programs and files on the target server and on any bridges between the Macintosh network and that server.

For native MHS products such as BeyondMail, Da Vinci, and Futurus, setup involved installing the E-mail product

and modifying the address directory to add users on the foreign E-mail products. You can optionally set MHS to assume some people will be using BeyondMail, others will use Da Vinci, and so forth. You do this by defining the preferred MHS application.

Being all MHS-based products, they had many, but not all, procedures in common. Generally, MHS user information is stored in two places: at MHS itself, and in the E-mail product's address directory.

A product received a bonus if the E-mail product was native to MHS, as no gateway setup was necessary. Otherwise, gateway installation was expected to be a two-step process to earn a score of satisfactory. Products lost points if they required a dedicated machine to run the gateway or connection server.

Products were expected to make the addition and editing of remote addresses no more difficult than the local ones in order to get a satisfactory score. Products that made it easier to enter remote addresses received bonuses.

MAINTENANCE:

We evaluated the difficulty in building and maintaining user address books, both public and private. We considered the difficulty in ironing out problem paths, where messages couldn't get through in one direction or another. Products that provided some means for easing this burden earned bonuses. If we encountered any special difficulties, points were subtracted.

We took into account the mail product's facility for adding or modifying remote user addresses once the gateway was installed and running. Products had to make this no more difficult than adding or maintaining local addresses to earn a score of satisfactory.

Occasionally, other maintenance factors came into play, such as what it takes to patch problems, get around unusual in-

compatibilities, and clean up directories and queues corrupted by message transfer errors.

INTEROPERABILITY:

We used a weighted report card for scoring interoperability. The features we checked were divided into four categories: message, attachments, addressing, and replies. Each path could earn up to 25 points for each category, with a perfect score of 100 for all categories. The features in each category were weighed according to relative importance to basic messaging. The highest weightings went to factors that involved getting a message, its subject and priority, and its attachments through in one piece to all the intended recipients and getting the addresses through so that the recipients could reply to anyone in the To: list. Lesser weightings went to features that made messaging more convenient but did not prevent the successful transfer of a message or its replies.

Features that may be annoying when they don't survive a message trip but aren't essential for basic E-mail communications were weighted low — word wrap and friendly addressing, for instance. We also considered a reply to recipients on the original To: list as more important than a reply to someone on the original cc: list. The weightings we used are indicated in the individual product interoperability charts.

Outgoing messages had the priority set to urgent, or its closest approximation, and return receipt was enabled where possible (Solaris Mail Tool did not support priority or return receipt). The subject line contained the string:

E-mails @inworld #2 interoperability with MHS Backbone.

The message text was 8,400 bytes long, with an original word wrap margin set to 80 characters (a full screen's width). We

See HOW WE TEST, page 82

Executive summary

Given the choice between integrating E-mail using PC-based X.400 or NetWare MHS, we'd pick MHS every time. But at present, it's still only the lesser of two evils. Fortunately, there are more choices, such as Alisa Mail (a SQL Server-based E-mail integration system that runs on a VAX), and the Retix and Isocor X.400 servers and gateways are continually being updated. We'll explore some of the new alternatives and revisit old ones in coming months.

These E-mail products, if evaluated alone, might stack up entirely differently. We're not comparing E-mail, we're comparing the interoperability of nine E-mail products using MHS and these gateways. We scored the average interoperability when connected to all the products involved. While this score is of some value, it's better to check the scores of each individual message path that you will have at your own site.

BeyondMail enjoyed the best performance across more message paths than any other E-mail product. Of course,

being a native MHS application, it did best when communicating with other MHS programs. It also had some of the best connectivity with the Macintosh E-mail users. Those two, Microsoft Mail for AppleTalk Networks and QuickMail for the Macintosh, were next in line. Of the two, QuickMail was easier to maintain. Both Macintosh products made addressing transparent to the end-user — all they ever have to see is friendly user names, but they can zoom in to see where the message will actually be routed.

Da Vinci eMail gave us mixed results but still had most of its paths rate satisfactory or above. Da Vinci's biggest problem surfaced when we used it to reply to all original recipients. Because this operation simply puts all the addresses on the carbon copy line, it runs out of room for addresses very quickly.

Microsoft Mail for PC Networks had the best consistency using an X.400 backbone, but it didn't fare as well this time. Microsoft Mail was never able to get its local addresses to any other product. It was among the easiest to set up, however.

Futurus Team was the easiest product to set up but ranked somewhat below Da Vinci in interoperability. Futurus could not get a message through to Microsoft Mail for PC Networks at all when the Mi-



crosoft Mail user was one in a list of multiple recipients.

The interoperability score for WordPerfect Office was skewed by a missing feature — there was no means of responding to original recipients. Otherwise, WordPerfect Office did rather well. It gets kudos for working around the SMF 64 limitation of sending only one file attachment by breaking multiple file attachments into several messages. Solaris Mail Tool benefited from this — it got all six file attachments only when WordPerfect Office was the sender. cc:Mail, on the other hand, couldn't get more than one file attachment across at a

time to anyone. This is primarily why cc:Mail had only two good paths, with the rest rating poor or unacceptable.

If we learned nothing else, it was to use something else on the Sun Sparc 10 besides Mail Tool. It is good, but e-mail, but two of the features we were testing for — priority and receipt — didn't get through simply because Mail Tool doesn't support them. This makes our final score somewhat misleading, but not entirely. The SMF 64-compliant gateway did not support passing more than one file attachment with a message, which hurt its score considerably.

SETUP

BeyondMail	Good
cc:Mail	Satisfactory
Da Vinci eMail	Good
Futurus Team	Good
Microsoft Mail for AppleTalk Networks	Good
Microsoft Mail for PC Networks	Very Good
QuickMail for the Macintosh	Satisfactory
Solaris Mail Tool	Poor
WordPerfect Office	Poor

Setup included all the steps it took to get the E-mail program running and connected to all the others via MHS. This included installation of the E-mail software and any gateways needed. It also included setting up MHS to see the new gateway on the system and making appropriate additions to the E-mail public address directory.

Futurus was the easiest of the MHS group to set up. Of the non-MHS products, Microsoft Mail for PC Networks ranked highest. The WordPerfect gateway to the Solaris Mail Tool ranking a very close second.

All products let you create aliases for friendly user names, so what you see when you address a new message won't be as confusing as what you get behind the scenes. Most products made the process of entering these names into the directory fairly simple. The best were Microsoft Mail for AppleTalk Networks, Solaris Mail Tool, BeyondMail, and Da Vinci eMail.

Addressing foreign users can be tricky. Most products simply need a user name and gateway address (username@gateway). Some E-mail products required more information, in particular Microsoft Mail for PC Networks and Solaris Mail Tool.

BEYONDMAIL: BeyondMail didn't require a gateway, as it uses MHS directly. All we had to do to get it communicating with other mail products was to add the correct remote addresses to the BeyondMail public address book. BeyondMail provides a data entry form that is supposed to expedite adding remote addresses, but we found it easier to add them manually. Overall, it was simple to get BeyondMail connected to our system.

CC:MAIL: You can use a single machine to run both the cc:Mail-MHS gateway and MHS itself, but we dedicated a machine to the cc:Mail gateway for better perfor-

mance. We defined the cc:Mail gateway at MHS the way you would any external gateway.

You define the gateway in cc:Mail to look like just any other post office. Instead of entering an address for the post office as you normally would when editing the address directory, you enter a command that calls MHSLink (one of the gateway programs). If you want to send a message to a remote user via MHS, you simply pass the message to this gateway post office.

We had to make entries into the cc:Mail database for each gateway we defined in MHS. The return address on any incoming MHS message included the user name and gateway (for example, rcky@wpo for a WordPerfect Office user). Without a WPO entry pointing back to MHS, replying to incoming messages was impossible.

One big gripe we have with cc:Mail involves the poorly designed administration interface. If you have a user named Joe Smith and you need to add another similar but shorter user name, such as Joe Smit, you can't. cc:Mail will always interpret an attempt to add Joe Smit as an attempt to edit the existing user, Joe Smith. You can play tricks to get around this (rename Joe Smith to Bob Smith, add Joe Smit, and then rename Bob back to Joe), but such measures should never be necessary for such a common operation.

DA VINCI E-MAIL: Like BeyondMail and Futurus Team, Da Vinci is a native MHS E-mail system, so a separate gateway installation to MHS was not required. The Da Vinci installation program is very straightforward.

We chose to add our own addresses to the Da Vinci eMail system manually, though there is an administration program that can move MHS users over to the Da Vinci eMail system. Da Vinci's installation program defaults to setting all users to be Da Vinci users. If, like us, you want some of your users on Da Vinci, others on BeyondMail, and so on, you can set up a special group of users for Da Vinci at MHS and use the administration program to convert only that group.

FUTURUS TEAM: Futurus Team is a native MHS package, so no gateway was needed. The overall installation of Futurus Team was by far the easiest — or would have been if we didn't have any problems. The installation

process located the MHS directory and synchronized the two systems to work together.

We ran into addressing problems as soon as we started testing. Futurus was scrambling addresses when we replied to all original recipients. A call to Futurus got us one update, and then another (and then another), and then we had problems installing the updates. (See Down to the Wire, page 63.)

The new installation program, while much prettier, isn't as smart as it should be. It leaves all the old icons in the Windows program group and doesn't remove a statement from the *WIN.INI* file that causes Windows to attempt to load a driver which is no longer needed. Like most E-mail products, you can enter a remote user address ad-hoc style when you create a message. If you so choose, Futurus will then add that address to the address book for you.

You can also create your own data entry forms and remote addresses by editing a text file called *FT.REF* with your own text editor. The process is oblique, to say the least, and the poorly written manual won't help at all. We were able to build addresses and dialog boxes after a little experimentation by using the existing entries in *FT.REF* as examples.

Futurus Team is the only program that requires a DOS TSR to be loaded for the system to operate, even if you intend to use only the Windows version of the program. The Futurus Team TSR must be logged in as the "global" user (Futurus' name for the administrator) to add or edit local user addresses.

MICROSOFT MAIL FOR APPLE TALK NETWORKS: We installed Microsoft Mail for AppleTalk Networks and StarNine's Mail-Link MHS gateway for MS Mail. The gateway runs on the same machine used for Microsoft Mail for AppleTalk, so no extra Macintosh is needed to get up and running.

The disk names that appeared in the documentation and on-screen during installation did not match the names on the labels, although it was easy enough to figure out which disks to use. The documentation also did not explain the installation process in great detail, and

REPORT CARD

E-mail interoperability via MHS backbone

Criteria	(Weighting)	BeyondMail	cc:Mail	Da Vinci eMail	Futurus Team	Microsoft Mail for AppleTalk Networks	Microsoft Mail for PC Networks	QuickMail	Solaris Mail Tool	WordPerfect Office
Setup	(100)	Good	Satisfactory	Good	Good	Good	Very Good	Satisfactory	Poor	Poor
Maintenance	(300)	Good	Good	Satisfactory	Satisfactory	Satisfactory	Good	Good	Good	Satisfactory
Interoperability	(600)	Good	Unacceptable	Satisfactory	Poor	Good	Poor	Good	Unacceptable	Poor
Score ¹		6.2	2.3	5.1	3.6	5.8	4.1	6.1	2.1	3.2

¹ These scores reflect the products in an interoperability setting. They do not reflect on the products' performance when used alone.

GUIDE TO REPORT CARD SCORES

InfoWorld reviews only finished, production versions of products, never beta test versions.

Products receive ratings ranging from unacceptable to excellent in various categories. Scores are derived by multiplying the weighting (in parentheses) of each criterion by its rating, where:

Excellent = 1.0 — Outstanding in all areas.

Very Good = 0.75 — Meets all essential criteria and offers significant advantages.

Good = 0.625 — Meets essential criteria and includes some special features.

Satisfactory = 0.5 — Meets essential criteria.

Poor = 0.25 — Falls short in essential areas.

Unacceptable or N/A = 0.0 — Falls to meet minimum standards or lacks this feature.

Scores are summed, divided by 100, and rounded down to one decimal place to yield the final score out of a maximum possible score of 10 (plus bonus). Products rated within 0.2 points of one another differ little. Weightings represent average relative importance to InfoWorld readers involved in purchasing and using that product category. You can customize the report card to your company's needs by using your own weightings to calculate the final score.

This product comparison concentrates on the E-mail interoperability of the nine products under test, and each final score reflects that product's capability to communicate effectively in both directions with each of the other products, including itself. Because this evaluation does not follow our usual method of isolating each individual product under test, we have not considered any of the products for our Buyers Assurance Seal. In the July 19, 1993 issue, we will review many of these products in our normal style and report in-depth on their features and suitability for common E-mail tasks.

INTEROPERABILITY MATRIX

INFO
WORLD

From:	To:									
Message	BeyondMail	cc:Mail	Da Vinci eMail	Futurus Team	Microsoft Mail for AppleTalk Networks	Microsoft Mail for PC Networks	QuickMail	Solaris Mail Tool	WordPerfect Office	Average send
BeyondMail	Excellent	Unacceptable	Good	Excellent	Very Good	Very Good	Very Good	Poor	Poor	Good
cc:Mail	Poor	Poor	Unacceptable	Poor	Poor	Unacceptable	Poor	Poor	Unacceptable	Unacceptable
Da Vinci eMail	Very Good	Unacceptable	Excellent	Satisfactory	Good	Poor	Good	Unacceptable	Unacceptable	Poor
Futurus Team	Excellent	Unacceptable	Good	Very Good	Unacceptable	Unacceptable	Unacceptable	Unacceptable	Poor	Unacceptable
Microsoft Mail for AppleTalk Networks	Very Good	Good	Satisfactory	Poor	Excellent	Very Good	Excellent	Unacceptable	Poor	Good
Microsoft Mail for PC Networks	Poor	Poor	Poor	Satisfactory	Satisfactory	Poor	Satisfactory	Unacceptable	Unacceptable	Poor
QuickMail	Good	Good	Satisfactory	Satisfactory	Very Good	Very Good	Excellent	Unacceptable	Poor	Satisfactory
Solaris Mail Tool	Poor	Poor	Unacceptable	Unacceptable	Satisfactory	Poor	Satisfactory	Satisfactory	Unacceptable	Poor
WordPerfect Office	Good	Unacceptable	Good	Good	Good	Satisfactory	Good	Satisfactory	Poor	Satisfactory
Average receive	Good	Unacceptable	Satisfactory	Satisfactory	Satisfactory	Poor	Good	Unacceptable	Unacceptable	

we found ourselves guessing at some points. Despite this, installation went fairly smoothly.

Microsoft Mail for AppleTalk Networks makes it very easy to add foreign addresses. The full address is entered as an alias on a data entry form.

MICROSOFT MAIL FOR PC NETWORKS: The Microsoft Mail Gateway to MHS installation was very simple. The installation program simply prompts you for the location of the Microsoft Mail data files. After installing the gateway, it's just a matter of defining a gateway for MHS on the MHS host and then copying the appropriate programs to the correct MHS directory.

The Microsoft Mail administration program makes it very easy to add MHS user addresses. Like MS Mail for the Mac, you simply add a normal user name and then the user's MHS alias.

Several of our E-mail systems were able to use simple addressing to reach the Microsoft Mail recipient (earl@mmail, for example), while other mail systems required a more precise extended address that listed the network, post office, and user name (earl@mmail@calvin.psent/earl). We could only determine which by experimentation.

QUICKMAIL FOR THE MACINTOSH: QuickMail runs its gateway on the same Macintosh used for the QuickMail server, so no extra machine is needed to get QuickMail connected to MHS. As is typical of Macintosh software, it was very easy to install the StarNine MHS gateway. The manual had adequate installation instructions.

It was very easy to enter outgoing remote addresses. QuickMail has an address form in which you specify the user name, post office (in this case, the post office is the gateway to MHS), and the alias address.

The Achilles' heel of QuickMail is its method for building and maintaining address directories. QuickMail doesn't have a public address book per se. Instead, it provides a central database from which you can draw to add names to your private address book. The central database is managed by the QuickMail name server. Maintaining the name server database itself is pretty easy, but it is a time-consuming process to create users' address books from the name server. Every time you update the name server, you need to shut down and restart for those updates to take effect. Then all users must validate their address books to check their addresses against the updated database and manually add, replace, or delete addresses from their individual directories as needed.

SOLARIS MAIL TOOL: Solaris Mail Tool is a simple utility that is automatically installed with the Solaris operating system.

We used the Computer Mail Services S-Bridge MHS to Simple Mail Transfer Protocol (SMTP) gateway. This gateway was one of the most difficult installations we've done. Since the gateway machine is connected to NetWare 3.11S and the Sun, you need that machine to support both protocols used — IPX and TCP/IP. CMS licenses FTP's PC/TCP as their TCP/IP driver and supplies the drivers you need for your specific network

interface card (NIC). The version they license is two versions behind what FTP is shipping separately. This older version will not let you use IPX and TCP/IP on the same network card (the latest version will). This means you'll need to set up two NICs in the gateway machine; one for your connection to MHS, another for the Sun connection.

The gateway we ordered supported only one MHS server. Although that's all we had running, the QuickMail gateway presents itself to the system as though it were another MHS server, so S-Bridge thought it was getting messages from two different installations of MHS. We needed to upgrade our package to be able to get QuickMail messages through.

Call it a more complex problem, or call it an inadequate installation program, but most people won't get this gateway up and running without calling technical support. Fortunately, their technical support was superb — they had answers to our questions almost before we asked them. Nevertheless, it took about two days to get the gateway running.

For any other E-mail program to send messages to our Mail Tool user, the address had to be expanded somewhat. Instead of a simple cal@gateway, we needed an address like cal@gateway@cal@odie with Odie representing the TCP/IP address of our Sparstation.

WORDPERFECT OFFICE: The WordPerfect Mail gateway installation and setup proved to be one of the most demanding of all the DOS products that we tested and required calls to technical support. E-mail configuration information is stored in databases WordPerfect calls Notebooks. The gateway information must be defined in the host notebook so that the gateway appears to the system as another WordPerfect post office.

Clearly, the installation program for the gateway is not nearly as refined and easy to use as the Windows mail product itself. Careless errors can get you into a lot of trouble. When we started WordPerfect's connection server (which routes messages to and from MHS), we received an uninformative error message stating, "Invalid gateway host argument." We found the problem only through lengthy experimentation. To our surprise, we had entered the first six characters of our MHS serial number during the gateway installation instead of the last six characters. After correcting the gateway information in the host notebook and regenerating the office system, we received a new error stating, "Cannot access MHS directories." To our misfortune once again, we did not correctly point to the drive containing the MHS files; rather, we specified both the drive and the directory.

It takes more work to add both local and foreign addresses than with other products — there are far more fields to fill and more caveats, while not complex, are more cryptic in form than in the other products. For instance, our Microsoft Mail user alias expansion was WPMHS:F:MSMAIL:EARL.

MAINTENANCE

BeyondMail	Good
cc:Mail	Good
De Vinci eMail	Satisfactory
Futurus Team	Satisfactory
Microsoft Mail for AppleTalk Networks	Satisfactory
Microsoft Mail for PC Networks	Good
QuickMail for the Macintosh	Good
Solaris Mail Tool	Good
WordPerfect Office	Satisfactory

We tested maintenance by adding, deleting and updating foreign addresses in each product's address book. We considered how difficult it was to track down and fix problems with addresses when messages didn't get through. In addition, we looked at any reliability problems with the mail product or associated gateway. None of the gateways failed during testing.

All scores are scaled down somewhat by the fact that no gateway comes with an automatic means of exchanging directory information across dissimilar products. There is some improvement in this area, though.

Add-ons are available for some combinations of products, and more are sure to become available as demand increases.

StarNine has a suite of products called Mail-Link Directory Services, which searches directories on Quick-Mail, Microsoft Mail for AppleTalk Networks, Unix, and MHS.

This makes foreign address access when creating a message, without manually adding them or synchronizing directories across these formats. Synchronization programs are also becoming available from various vendors that will synchronize user directories across mail formats.

BEYONDMAIL: You maintain addresses in BeyondMail the same way you add them: using the data entry form or, as we preferred, by hand.

BeyondMail takes an additional .bmail marker onto return addresses, so that a reply from BeyondMail user mkizek would look like mkizek.bmail. This means any reply to that reply would get routed directly to BeyondMail, whether or not mkizek was defined at MHS to be a BeyondMail preferred user.

CC:MAIL: cc:Mail local and remote MHS addresses are maintained through the administration program as in setup. cc:Mail required a little more work to configure because a post office had to be defined for every gateway we accessed. Once that was done, however, it was about as easy to maintain addresses as with any other product.

See MAINTENANCE, page 74

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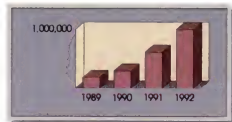
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MAINTENANCE / from page 71

DA VINCI EMAIL: We encountered some difficulties in editing addresses in Da Vinci. At one point, we suspected that Microsoft Mail for AppleTalk Networks was unable to reply to some addresses from a Da Vinci originated message because there were unwanted spaces in the full remote address. We were unable to isolate this as the problem because Da Vinci put the spaces back each time we removed them.

FUTURUS TEAM: Remote MHS addresses are set up and maintained manually in a text file called FT.REM, which is located in the Futurus directory on the network. Although Futurus is the only product that did not provide a built-in administration program for adding re-

more addresses, there is something to be said for using a familiar text editor to administer addresses — no new key-strokes to learn.

We spent more time working out problems with Futurus than with any other E-mail product. At one point, Futurus scrambled all the remote addresses when replying to messages. This was fixed in an update sent to us by their technical support. We still had intermittent problems with addresses that we could not iron out.

Futurus also has inadequate safeguards against mistakes. You can log in to the network as one user and start Futurus as another. It won't tell you there's a problem. It will show you an In box but simply won't show you any of your mail (probably due to insufficient rights on the network for that user). This can cause needless headaches when you're trying to track down connectivity problems while maintaining your address lists.

MICROSOFT MAIL FOR APPLE TALK NETWORKS: Although for the most part the gateway ran like a champ, we did run into a problem with the MHS folder. Under the MHS preference configuration, we directed the system to the MHS directory located at the root of the NetWare volume. Without this folder set, the gateway would not work. Unfortunately, we inexplicably lost the pointer to the folder from time to time, bringing the gateway to a halt. Redirecting the folder to the MHS directory would bring the gateway back up. This minor but pesky problem disappeared as mysteriously as it appeared about halfway through testing.

We encountered one wrinkle when using a normally useful feature in Microsoft Mail for the Mac. You can set it to examine addresses in an incoming message and then automatically update or add the addresses in your personal address book as needed. You will almost have to turn this feature off when using an MHS connection, because the feature can't tell the difference between a correctly formed address and a bad one. When addresses were formed incorrectly by the sending mail package (which will inevitably happen, despite all efforts), MS Mail for the Mac automatically revised the matching entry in the personal address book to contain the incorrect return address.

MICROSOFT MAIL FOR PC NETWORKS: Gateway maintenance is performed by using the Microsoft Mail administrator program. It is as easy to modify the address directory as it is to create it. You simply add or change user names and their foreign alias addresses.

The only hitch we found was how long it takes for mail users to send or receive messages. We couldn't find a way to force a message through in either direction; you just have to wait for Microsoft Mail to get to the point in its cycle where it will look for new messages or send outgoing ones. The best we could do was to set the cycle time to 1 minute. This makes for tedious maintenance when you want to pass test messages back and forth to verify your gateway configurations and see the results quickly.

QUICKMAIL FOR THE MACINTOSH: Although the name server makes setup very tedious, it has one benefit. It

makes directory propagation across post offices simpler. The name server polls existing QuickMail post offices and then automatically builds a complete list of addresses within your organization. Because the MHS gateway looks like just another post office to QuickMail, the name server will automatically pick up any added MHS addresses when it goes through its polling process. You still have to reboot and update users' address books manually, a process so tedious it practically negates the beneficial effect of the name server.

QuickMail has a feature that speeds up troubleshooting. Normally, QuickMail will check the MHS gateway periodically, depending on how you've configured the cycle time. However, a single keystroke will force pending messages through the gateway without waiting for the normal cycle to complete.

SOLARIS MAIL TOOL: The gateway administration program has some nice touches that set it apart from all the other products. You can define incoming and outgoing aliases at the gateway itself, which makes directory maintenance simpler. For example, you can simply send a message to the user Garfield at the SMTP gateway without adding the full remote address. The gateway will expand it to the proper Solaris Mail Tool address of Garfield (Garfield@node). In the long run, it's probably easier to sort out the organization and maintenance of addresses by keeping them at their respective mail packages. But we were able to use this feature to compensate for some unwanted address scrambling. Some products mixed up our Unix user's address when replying to a message. We added the mixed-up version of the address to the alias list at the gateway, and the gateway substituted the correct address when it received those messages.

SunSoft's Mail Tool makes it very easy to add alias addresses, although it doesn't make it very easy to use them. You can pop up a list of aliases but, though it's technically possible, you can't easily drag and drop the short recipient names. It's easier to type them in yourself.

WORDPERFECT OFFICE: Remote address maintenance is a bit more difficult than with other products, but not much more difficult than setting up local users (which is also more difficult than with other products). If you wish to modify or add users, it is necessary to edit the user notebook. Every time you edit this file, you must regenerate the office system. You do this by running a program called Genoff, which reads the information in the

INTEROPERABILITY		
BeyondMail	Good	
cc:Mail	Unacceptable	
Da Vinci eMail	Satisfactory	
Futurus Team	Poor	
Microsoft Mail for AppleTalk Networks	Poor	
Microsoft Mail for PC Networks	Poor	
QuickMail for the Macintosh	Good	
Solaris Mail Tool	Unacceptable	
WordPerfect Office	Poor	

We tested overall interoperability by addressing a message to a user on every product, including itself. The message was a priority of urgent or the closest equivalent.

The message included six file attachments and a large message body (over 8KB). We replied to all original recipients from each station that got the message. Then we replied to the reply from the originating station.

We cannot overemphasize that although the scores are associated with E-mail product names, we are not scoring the E-mail products themselves. The score is a composite calculated from tests that involved many message paths.

There were some obvious patterns. No mail product could communicate the urgent priority of a message correctly to all other products. In fact, cc:Mail, WordPerfect Office, and Mail Tool could not get the priority through to any other E-mail at all. (Mail Tool didn't have the feature.)

Da Vinci eMail was the only native MHS product that had perfect interoperability with itself. BeyondMail missed only friendly addressing of foreign addresses. Futurus missed friendly addressing and lost the original file dates. The rest of the products did not do as well working with themselves because the messages had to pass through a gateway twice (and MHS once) to make a round trip.

Every product except cc:Mail and Mail Tool was able to send all six file attachments. Mail Tool was theoretically capable of sending all six, but the program warns you that the amount of data is so large, all file attachments will be lost. The warning was moot — the SMF 64-compatible SMTP gateway could only send one file per message anyway. These file handling limitations seriously hurt the cc:Mail and Mail Tool scores, and cc:Mail's repeated mangling of return addresses hurt cc:Mail's score even more.

The original time stamp of an attached file was rarely communicated. Only BeyondMail, Da Vinci, and Microsoft Mail for PC Networks ever got a time stamp through, and then only to a couple of recipients. Microsoft Mail only got the time stamp through to itself. All products had problems with message word wrap. The best performers were cc:Mail, Futurus, WordPerfect Office, and Unix, getting word wrap through to at least half the recipients.

Microsoft Mail for AppleTalk Networks and QuickMail consistently represented incoming foreign addresses in a friendly manner — just a user name with no path. The other products could do this only occasionally and only with a few of the incoming addresses.

Mail Tool had two important limitations — it couldn't set a priority, and it could not request a return receipt. This affected the score for all paths to and from Mail Tool. WordPerfect Office has no feature to reply to all original recipients. This brought down the score for all paths to and from WordPerfect Office.

BEYONDMAIL: BeyondMail had the best average interoperability overall, with four paths scoring excellent and five very good. It wasn't immune to problems, however. It had five poor paths and one unacceptable path to cc:Mail.

BeyondMail missed getting the priority through to all but itself and Futurus Team. The only anomaly in the pattern otherwise was when Microsoft Mail for PC Networks sent a message to BeyondMail. BeyondMail did not receive the local users in the list of original recipients (and therefore could not respond to them).

The worst connection was to cc:Mail, which mangled the list of original recipients sent by BeyondMail and was able to reply to only the BeyondMail originator.

CCMAIL: Paths to and from cc:Mail were most often poor or unacceptable. Its best interoperability was with the two Macintosh users, scoring good on both when cc:Mail was on the receiving end.

cc:Mail's MHSLink program is limited to MHS SMF 64 compatibility. SMF 64 only allows for one file attachment to be included with any message going through the MHS gateway. Some programs (such as WordPerfect Office's MHS gateway) are written intelligently enough to work around the single file attachment limitation by sending a separate message for each file attachment.

cc:Mail's MHSLink program isn't. Recipients of a message with multiple file attachments received only one and did not receive any notification of the missing file attachments.

In addition, SMF 64 limits you to a message size of 8KB. Our test message (which was a bit over 8KB) was not sent from cc:Mail to the other E-mail packages in its entirety. When viewing the message in the other packages, a note that the message was truncated was included at the end.

When receiving messages from four

out of nine packages, ccMail could not reply back to all the original recipients. In a message sent to 10 people in different packages, ccMail received an average of four people in the original To: list. Of those four addresses, some came in listed correctly, others were badly corrupted. Sometimes it even blended two different E-mail user names and addresses into one address.

DA VINCI: Da Vinci eMail received the correct priority from four of the nine systems. Da Vinci always truncates the subject line on incoming messages because it has a shorter subject line than all the other products. All the mail systems except Mail Tool and ccMail were able to return a receipt to Da Vinci. Only the Macintosh products and Da Vinci itself received the correct priority. Only BeyondMail and Da Vinci were able to reply to all the original recipients when Da Vinci originated the message.

Da Vinci provides only a hedgepodge means of replying to all original recipients — it really looks like it was added as an afterthought. When you reply to a message, you can have Da Vinci place all the original recipients on the cc: line. Unfortunately, the list of original recipients often exceeded the maximum available space in the carbon copy line. To make matters worse, it simply truncates whatever address happens to be at the character limit instead of ending the list at a logical break point (between two addresses). That last address is, naturally, invalid and sometimes prevents Da Vinci from sending a reply to all unless you delete or fix the address.

FUTURUS TEAM: The main problems we encountered were due to Futurus Team's inability to send out accurate addresses across platforms. When sending out our test message, we noticed that Futurus Team for Windows was appending what appeared to be a graphics character to each address. Further inspection showed that a carriage return character was being added to the end of each address string. We suspect the spurious character could be part of the reason Microsoft Mail did not get the messages from Futurus, particularly if Microsoft Mail is picky about how it receives addresses. Many products expect a null- or zero-terminated string as an address, not a carriage return terminated string, though most know enough to strip out the unwanted character when they see it.

When we sent out the message from Futurus, we ran across a reply problem in both QuickMail and Microsoft Mail for the Mac. Although both products received the message from Futurus Team, they were unable to reply back to many of the names that appeared on the To: list of the message.

In all cases, the entire message sent from Futurus was received intact. All file attachments were listed and verified, and every package except ccMail was able to return a receipt back to Futurus Team. In eight out of nine cases, the message generated in Futurus Team did not show up with the Urgent priority.

When receiving the message from other E-mail products, Futurus Team had intermittent problems in replying to all original addresses. In one of the earlier versions we tested, it couldn't reply to foreign addresses at all, but this was corrected in the next update. In the message generated from Microsoft Mail for the Mac, Futurus Team could not reply back to a few remote users. The names TEXT, BINA, and MDOs — file descriptors that were obviously misplaced into the address list — were added as recipients of the message. Sometimes this made it impossible to reply to a message even when accurate addresses were included in the list.

QuickMail did not show the Urgent priority on the incoming message in five out of eight cases, which was about the same as the other packages in this comparison. Futurus Team received the entire message in all cases except from ccMail and WordPerfect Office.

MICROSOFT MAIL FOR APPLE TALK NETWORKS: When our test message was generated from Microsoft Mail for AppleTalk Networks, all recipients received the entire message, all six file attachments were received (except at Mail Tool) and verified, and all were able to view the original To: and cc: lists. All except Mail Tool were able to return a receipt to the originator. Unix sent a message indicating that the "Mail Delivery Subsystem" had read the message, but there was no indication of who the user was, so we could not say that this was an actual receipt from Mail Tool.

All recipients except Da Vinci, Futurus, and Word-

Perfect Office were able to reply to the local Microsoft Mail for AppleTalk Network addresses. Da Vinci couldn't reply because of its space limitation in the To: line. Futurus couldn't reply because of invalid user names that were tacked on to the address list. WordPerfect Office simply can't reply to all recipients of a message. Microsoft Mail for AppleTalk could only pass the Urgent priority request to itself, QuickMail, and Da Vinci.

Microsoft Mail was one of two products that consistently displayed friendly user addresses in the original recipient list. Microsoft Mail was able to return a receipt to all subsystems except Unix and QuickMail.

MICROSOFT MAIL FOR PC NETWORKS: Microsoft Mail for PC Networks failed to send the addresses of the local To: and the local cc: to any of the other mail systems, including itself. All of the mail systems received the subject of the message truncated at 40 characters. All nine mail systems, including itself, received the message with the incorrect word wrap in the message. The original file data sent to itself (only Da Vinci and BeyondMail could do the same). All nine mail systems received all the foreign addresses and were able to reply to all the foreign recipients (except WordPerfect, which has no option to reply to all recipients).

Microsoft Mail did not receive the originating message from Futurus. Microsoft Mail also never received the correct message priority from any of the nine mail systems, including itself. Microsoft Mail had difficulties replying to Da Vinci messages because the local addresses were not listed.

MHS addresses often required a commented user name for correct routing. If a Mark Kizidek and Mel Kizidek exist on a single mail system, Mel and Mark would share the same base MHS address, e.g. mkizidek@postw. An address with a full user name in a comment field, such as mkizidek@postw (mel kizidek), routes the address to the correct user (parentheses denote comments in MHS). Microsoft Mail sometimes routed the addresses incorrectly when the list included addresses with comments. Microsoft Mail would split the comment and attempt to send a reply to the orphaned portion, kizidek@. Microsoft Mail occasionally mangled the Mail Tool SMTP addresses, as well.

QUICKMAIL FOR THE MACINTOSH: QuickMail showed reasonable connectivity to all products and did surprisingly well when sending messages to ccMail. Only Microsoft Mail for AppleTalk Networks did as well with ccMail, which was consistently poor on the receiving end, otherwise.

Da Vinci, Futurus, and WordPerfect Office could not respond to all the original recipients. Da Vinci got all the addresses, but the local addresses were not formed correctly. Futurus didn't get the cc: addresses, and so could not respond to them. WordPerfect doesn't have the feature.

Only Da Vinci, Microsoft Mail for AppleTalk Networks, and QuickMail received the correct priority. BeyondMail, Microsoft Mail for AppleTalk Networks, and Mail Tool failed to return a receipt.

SOLARIS MAIL TOOL: Mail Tool does not let you set the priority on an outgoing message, nor does it look for a

priority on any incoming messages. Mail Tool also does not have a return receipt request feature. It was impossible to exercise the system completely because of these limitations.

Mail Tool was unable to receive all six file attachments except when the message was broken into six by WordPerfect Office. Likewise, although Mail Tool is capable of sending multiple file attachments, it couldn't get six files through the gateway.

Perhaps the biggest surprise in our testing was when Mail Tool received the original file data along with the one file that made it through from BeyondMail. With the poor track record of transferring of file dates across like platforms (PC E-mail to PC E-mail), we never expected to see a successful pass between PC E-mail and the Sun. If a file attachment is a text file, it arrives at Mail Tool as text included in the message (though it is clearly marked so that you can extract it apart from the message text). Other files are "uencoded" and appear in the message as a series of codes. The file must be extracted from the message using the Unix utility, uudecode.

Mail Tool handled outgoing and incoming address lists surprisingly well. Only Da Vinci was unable to respond to all original recipients when the message originated at Da Vinci, and then only because of a limitation in Da Vinci.

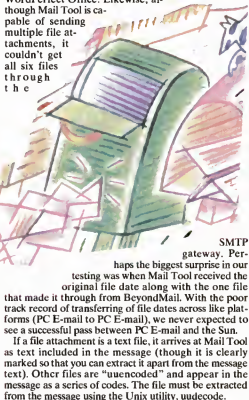
WORDPERFECT OFFICE: WordPerfect Office was the only product in this comparison that could not reply to all original recipients of a message. Though this is a feature limitation and not one born of interoperability, it is still reflected in the score. WordPerfect users who have learned to live without this feature may not miss it, but most other E-mail users who don't necessarily know where a message will end up when they send it may not be as forgiving when the recipients can't respond as expected.

WordPerfect Office's gateway to MHS is only SMF 64, which supports only one file attachment per message. The WordPerfect gateway managed to ship all six file attachments by sending them as six separate messages (the gateway automatically breaks up any outgoing messages with multiple attachments). Our Unix Mail client reaped some benefit from this method, as it received all six files only when WordPerfect was the originator.

All the products received a complete list of original recipients except ccMail, which received only four of the 12 addresses. The rest were able to reply to all original recipients (except WordPerfect, which has no option to do so). All mail systems returned a receipt to WordPerfect except Mail Tool. WordPerfect was unable to get the correct message priority through to any of the nine mail systems.

WordPerfect was the only product that was unable to contain our larger-than-8Kb message in the message body, so the outgoing message was truncated by necessity. Also, WordPerfect was the only product to add the text "6 attachments" to the subject line. While this is informative, it caused some problems with some products. ccMail and Microsoft Mail for PC Networks lost the subject line completely, except for the added attachments message.

WordPerfect was never able to receive the correct priority from any of the mail systems, even from WordPerfect itself. WordPerfect was always able to generate a message receipt when requested.



From:	To:								
BeyondMail Message	BeyondMail	cc:Mail	De Vinci eMail	Futurus Team	Microsoft Mail for AppleTalk Networks	Microsoft Mail for PC Networks	QuickMail	Solaris Mail Tool	WordPerfect Office
(3)	Yes	Yes	No ²	Yes	Yes	Yes	Yes	Yes	Yes
Return receipt	(5)	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Priority	(5)	Yes	No	No	Yes	No	No	No	No
Entire message received	(8)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Single message	(2)	Yes	No	Yes	Yes	Yes	Yes	No ²	Yes
Word wrap	(2)	Yes	No	No	No	No	No	No	No
Attachments									
Six files verified	(12)	Yes	Yes	Yes	Yes	Yes	Yes	No ²	Yes
Original file dates	(3)	Yes	No	No	No	No	No	No ²	No
Names listed/associated	(10)	Yes	Yes	Yes	Yes	Yes	Yes	No ²	Yes
Addressing									
All foreign in To: list	(6)	Yes	No ²	Yes	Yes	Yes	Yes	Yes	Yes
Foreign cc: listed	(2)	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Local To: listed	(6)	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Local cc: listed	(2)	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Addresses accurate	(8)	Yes	No	No ²	Yes	Yes	Yes	Yes	Yes
Addresses friendly	(1)	No	No	No	Yes	No	Yes	No	No
Replies									
Reply to originator	(6)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reply to all foreign	(6)	Yes	No	Yes	Yes	No ²	Yes	Yes	N/A
Reply to local To:	(6)	Yes	No	Yes	Yes	Yes	Yes	Yes	N/A
Reply to local cc:	(2)	Yes	No	Yes	Yes	Yes	Yes	Yes	N/A
Reply to reply	(5)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
*Subject was truncated. *Only one file was received and verified. *Only one foreign address arrived. *De Vinci often truncates the return address list. *Replied to five of six.									

From:	To:								
cc:Mail Message	BeyondMail	cc:Mail	De Vinci eMail	Futurus Team	Microsoft Mail for AppleTalk Networks	Microsoft Mail for PC Networks	QuickMail	Solaris Mail Tool	WordPerfect Office
(3)	Yes	Yes	No ²	Yes	Yes	Yes	Yes	Yes	Yes
Return receipt	(5)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Priority	(5)	No	No	No	No	No	No	No	No
Entire message received	(8)	No ²	No ²	No ²	No ²	No ²	No ²	No ²	No ²
Single message	(2)	N/A ¹	N/A ¹	N/A ¹	N/A ¹	N/A ¹	N/A ¹	N/A ¹	N/A ¹
Word wrap	(2)	Yes	Yes	Yes	Yes	No	No	Yes	Yes
Attachments									
Six files verified	(12)	No ²	No ²	No ²	No ²	No ²	No ²	No ²	No ²
Original file dates	(3)	No	No	No	No	No	No	No	No
Names listed/associated	(10)	No	No ²	No ²	No ²	No ²	No ²	No ²	No ²
Addressing									
All foreign in To: list	(6)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Foreign cc: listed	(2)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Local To: listed	(6)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Local cc: listed	(2)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Addresses accurate	(8)	Yes	Yes	No ²	Yes	Yes	Yes	Yes	Yes
Addresses friendly	(1)	No	No	No	Yes	No	Yes	No	No
Replies									
Reply to originator	(6)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reply to all foreign	(6)	Yes	Yes	No	Yes	Yes	Yes	Yes	N/A
Reply to local To:	(6)	Yes	Yes	No	Yes	Yes	Yes	Yes	N/A
Reply to local cc:	(2)	Yes	Yes	No	Yes	Yes	Yes	Yes	N/A
Reply to reply	(5)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
*Subject was truncated. *Messages larger than 8KB will be truncated. *Only one file attachment arrived. *The single file that arrived had its name listed and associated. *De Vinci often truncates the return address list.									

From:	To:								
De Vinci eMail Message	BeyondMail	cc:Mail	De Vinci eMail	Futurus Team	Microsoft Mail for AppleTalk Networks	Microsoft Mail for PC Networks	QuickMail	Solaris Mail Tool	WordPerfect Office
(3)	Yes ¹	Yes ¹	Yes ¹	Yes ¹	Yes ¹	Yes ¹	Yes ¹	Yes ¹	Yes ¹
Return receipt	(5)	Yes	No	Yes	Yes	Yes	Yes	No ²	Yes ¹
Priority	(5)	No	No	Yes	No	Yes	No	No	No
Entire message received	(8)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Single message	(2)	Yes	No	Yes	Yes	Yes	Yes	N/A ²	No
Word wrap	(2)	No	No	Yes	No	No	No	No	No
Attachments									
Six files verified	(12)	Yes	Yes	Yes	Yes	Yes	Yes	No ²	Yes
Original file dates	(3)	Yes	Yes	Yes	Yes	Yes	Yes	No ²	Yes
Names listed/associated	(10)	Yes	Yes	Yes	Yes	Yes	Yes	No ²	Yes
Addressing									
All foreign in To: list	(6)	Yes	No ²	Yes	Yes	Yes	Yes	Yes	Yes
Foreign cc: listed	(2)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Local To: listed	(6)	Yes	No	Yes	Yes	No ²	No ²	No	No
Local cc: listed	(2)	Yes	No	Yes	Yes	No	No	No	No
Addresses accurate	(8)	Yes	No ²	Yes	Yes	No	No	No	No
Addresses friendly	(1)	No	No	Yes	No	Yes	No	No	No
Replies									
Reply to originator	(6)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reply to all foreign	(6)	Yes	No ²	Yes	No	No ²	Yes	Yes	N/A
Reply to local To:	(6)	Yes	No	Yes	No	Yes	Yes	No	N/A
Reply to local cc:	(2)	Yes	No	Yes	No	No	No	No	N/A
Reply to reply	(5)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
*De Vinci will not permit us to use our long subject line. *Only one file attachment arrived. *Only four foreign addresses were listed. *The local address was listed. *Only two of 12 addresses were accurate. *De Vinci often truncates the return address list. *Not all the original recipient addresses arrived.									

From: Futurus Team Message	To:	BeyondMail	cc:Mail	De Vinci eMail	Futurus Team	Microsoft Mail for AppleTalk Networks	Microsoft Mail for PC Networks	QuickMail	Solaris Mail Tool	WordPerfect Office
(Weighting)										
Subject	(3)	Yes	Yes	No ¹	Yes	Yes	N/A	Yes	Yes	Yes
Return receipt	(5)	Yes	No	Yes	Yes	Yes	N/A	Yes	Yes	Yes
Priority	(5)	Yes	No	No	N/A	No	No	No	No	No
Entire message received	(8)	Yes	Yes	Yes	Yes	Yes	N/A	Yes	Yes	Yes
Single message	(2)	Yes	No	Yes	Yes	Yes	N/A	Yes	No ²	No
Word wrap	(2)	Yes	No	Yes	Yes	Yes	N/A	Yes	Yes	Yes
Attachments										
Six files verified	(12)	Yes	Yes	Yes	Yes	No	N/A	Yes	No ²	Yes
Original file dates	(3)	No	No	No	No	No	N/A	No	No	No
Names listed/associated	(10)	Yes	Yes	Yes	Yes	Yes	N/A	Yes	No ²	Yes
Addressing										
All foreign in To: list	(6)	Yes	No ¹	Yes	Yes	No ¹	N/A	No ¹	No ¹	Yes
Foreign cc: listed	(2)	Yes	Yes	Yes	Yes	Yes	N/A	Yes	Yes	Yes
Local To: listed	(6)	Yes	No	Yes	Yes	No	N/A	Yes	Yes	Yes
Local cc: listed	(2)	Yes	No	Yes	Yes	No	N/A	No	No	No
Addresses accurate	(8)	Yes	No ¹	No ¹	Yes	No ¹	N/A	No ¹	No ¹	Yes
Addresses friendly	(1)	No	No	No	No	Yes	N/A	Yes	No	No
Replies										
Reply to originator	(6)	Yes	Yes	Yes	Yes	Yes	N/A	Yes	Yes	Yes
Reply to all foreign	(6)	Yes	No ¹	Yes	No	No ¹	N/A	No ¹	No ¹	N/A
Reply to local To:	(6)	Yes	No	Yes	Yes	No	N/A	No	Yes	N/A
Reply to local cc:	(2)	Yes	No	Yes	Yes	No	N/A	No	No	N/A
Reply to reply	(5)	Yes	Yes	Yes	Yes	Yes	N/A	Yes	Yes	Yes

¹Subject truncated. ²Only one file attachment arrived. ³Only four foreign addresses arrived. ⁴Only two foreign addresses arrived. ⁵Only one foreign address arrived.

⁶Only some addresses were accurate, sometimes because only some addresses arrived. ⁷Replied to some of the recipients. ⁸Da Vinci often truncates the return address list.

From: MS Mail for AppleTalk Networks Message	To:	BeyondMail	cc:Mail	De Vinci eMail	Futurus Team	Microsoft Mail for AppleTalk Networks	Microsoft Mail for PC Networks	QuickMail	Solaris Mail Tool	WordPerfect Office
(Weighting)										
Subject	(3)	Yes	Yes	No ¹	Yes	Yes	Yes	Yes	Yes	Yes
Return receipt	(5)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Priority	(5)	No	No	Yes	No	Yes	No	Yes	No	No
Entire message received	(8)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Single message	(2)	Yes	No	Yes	Yes	Yes	Yes	Yes	No ²	No
Word wrap	(2)	No	No	No	No	Yes	No	No	No	Office
Attachments										
Six files verified	(12)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No ³	Yes
Original file dates	(3)	No	No	No	No	No	No	No	No ³	No
Names listed/associated	(10)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No ³	Yes
Addressing										
All foreign in To: list	(6)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Foreign cc: listed	(2)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Local To: listed	(6)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Local cc: listed	(2)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Addresses accurate	(8)	Yes	No ¹	No ¹	Yes	Yes	Yes	Yes	Yes	Yes
Addresses friendly	(1)	No	No	No	No	Yes	No	Yes	No	No
Replies										
Reply to originator	(6)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reply to all foreign	(6)	Yes	Yes	No ¹	No ¹	Yes	Yes	Yes	Yes	N/A
Reply to local To:	(6)	Yes	Yes	No	No	Yes	Yes	Yes	Yes	N/A
Reply to local cc:	(2)	Yes	Yes	No	No	Yes	Yes	Yes	Yes	N/A
Reply to reply	(5)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

¹Subject was truncated. ²Only one file attachment arrived. ³Some addresses were accurate. ⁴Replied to those addresses that were accurate. ⁵Da Vinci often truncates the return address list.

From: MS Mail for PC Network Message	To:	BeyondMail	cc:Mail	De Vinci eMail	Futurus Team	Microsoft Mail for AppleTalk Networks	Microsoft Mail for PC Networks	QuickMail	Solaris Mail Tool	WordPerfect Office
(Weighting)										
Subject	(3)	No ¹	No ¹	No ¹	No ¹	No ¹	No ¹	No ¹	No ¹	No ¹
Return receipt	(5)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Priority	(5)	No	No	Yes	Yes	Yes	No	Yes	No	No
Entire message received	(8)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Single message	(2)	Yes	No	Yes	Yes	Yes	Yes	Yes	No ²	No
Word wrap	(2)	No	No	No	No	No	No	No	No	No
Attachments										
Six files verified	(12)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No ³	Yes
Original file dates	(3)	No	No	No	No	No	Yes	No	No	No
Names listed/associated	(10)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No ³	Yes
Addressing										
All foreign in To: list	(6)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Foreign cc: listed	(2)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Local To: listed	(6)	No	No	No	No	No	No	No	No	No
Local cc: listed	(2)	No	No	No	No	No	No	No	No	No
Addresses accurate	(8)	Yes	Yes	No ¹	Yes	Yes	Yes	Yes	Yes	Yes
Addresses friendly	(1)	No	No	Yes	No	Yes	No	Yes	No	No
Replies										
Reply to originator	(6)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reply to all foreign	(6)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A
Reply to local To:	(6)	No	No	No	No	No	No	No	No	N/A
Reply to local cc:	(2)	No	No	No	No	No	No	No	No	N/A
Reply to reply	(5)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

¹Subject truncated. ²Only one file attachment arrived. ³Da Vinci often truncates the return address list.

From:		To:										
QuickMail	(Weighting)	BeyondMail	cc-Mail	De Vinci eMail	Futurus Team	Microsoft Mail for AppleTalk Networks	Microsoft Mail for PC Networks	QuickMail	Solaris Mail Tool	WordPerfect Office		
Subject	(3)	No ¹	No ¹	No ¹	No ¹	No ¹	No ¹	No ¹	No ¹	No ¹	No ¹	No ¹
Return receipt	(5)	No ¹	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Priority	(5)	No	No	Yes	No	No	Yes	Yes	Yes	No	No	No
Entire message received	(8)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Single message	(2)	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No ²	No	No
Word wrap	(2)	No	No	No	No	No	No	No	No	No	No	No
Attachments												
Six files verified	(12)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No ²	Yes	Yes
Original file dates	(3)	No	No	No	No	No	No	No	No	No	No	No
Names listed/associated	(10)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No ²	Yes	Yes
Addressing												
All foreign in To: list	(6)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Foreign cc: listed	(2)	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Local To: listed	(6)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Local cc: listed	(2)	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Addresses accurate	(8)	Yes	Yes	No ³	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Addresses friendly	(1)	No	No	No	No	Yes	No	Yes	No	No	No	No
Replies												
Reply to originator	(6)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reply to all foreign	(6)	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	N/A	N/A
Reply to local To:	(6)	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A
Reply to local cc:	(2)	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	N/A	N/A
Reply to reply	(5)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

¹Subject was truncated.²Only one file attachment arrived.³De Vinci often truncates the return address list.

From:		To:										
Solaris Mail Tool	(Weighting)	BeyondMail	cc-Mail	De Vinci eMail	Futurus Team	Microsoft Mail for AppleTalk Networks	Microsoft Mail for PC Networks	QuickMail	Solaris Mail Tool	WordPerfect Office		
Subject	(3)	Yes	No ¹	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Return receipt	(5)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Priority	(5)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Entire message received	(8)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Single message	(2)	No ¹	No ¹	No ¹	No ¹	No ¹	No ¹	No ¹	No ¹	No ¹	No ¹	No ¹
Word wrap	(2)	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Attachments												
Six files verified	(12)	No ¹	No ¹	No ¹	No ¹	No ¹	No ¹	No ¹	No ¹	No ¹	No ¹	No ¹
Original file dates	(3)	No	No	No	No	No	No	No	No	No	No	No
Names listed/associated	(10)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Addressing												
All foreign in To: list	(6)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Foreign cc: listed	(2)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Local To: listed	(6)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Local cc: listed	(2)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Addresses accurate	(8)	No	No	No ¹	No	No	No	No	No	No	No	No
Addresses friendly	(1)	No	No	No	No	Yes	No	Yes	No	No	No	No
Replies												
Reply to originator	(6)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reply to all foreign	(6)	No	No	No	No	No	No	No	Yes	N/A	N/A	N/A
Reply to local To:	(6)	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	N/A	N/A
Reply to local cc:	(2)	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	N/A	N/A
Reply to reply	(5)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

¹Subject was truncated.²Could not successfully send to six files with a single message.³A single file sent through one entry.⁴De Vinci often truncates the return address list.

From:		To:										
WordPerfect Office	(Weighting)	BeyondMail	cc-Mail	De Vinci eMail	Futurus Team	Microsoft Mail for AppleTalk Networks	Microsoft Mail for PC Networks	QuickMail	Solaris Mail Tool	WordPerfect Office		
Subject	(3)	Yes	No ¹	No ¹	Yes	Yes	No ¹	Yes	Yes	Yes	Yes	Yes
Return receipt	(5)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Priority	(5)	No	No	No	No	No	No	No	No	No	No	No
Entire message received	(8)	No ¹	No ¹	No ¹	No ¹	No ¹	No ¹	No ¹	No ¹	No ¹	No ¹	No ¹
Single message	(2)	No	No	No	No	No	No	No	No	No	No	No
Word wrap	(2)	Yes	No	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes
Attachments												
Six files verified	(12)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Original file dates	(3)	No	No	No	No	No	No	No	No	No	No	No
Names listed/associated	(10)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Addressing												
All foreign in To: list	(6)	Yes	No ¹	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Foreign cc: listed	(2)	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Local To: listed	(6)	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Local cc: listed	(2)	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Addresses accurate	(8)	Yes	No	No ¹	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Addresses friendly	(1)	No	No	No	No	Yes	No	Yes	No	No	No	No
Replies												
Reply to originator	(6)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reply to all foreign	(6)	Yes	No ¹	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A
Reply to local To:	(6)	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A
Reply to local cc:	(2)	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A
Reply to reply	(5)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

¹Subject truncated and copied.²Subject truncated.³Messages less than 64K will not be truncated.⁴Only three of the foreign addresses arrived.⁵De Vinci often truncates the return address list.⁶Replied to two of the three that were in the list.

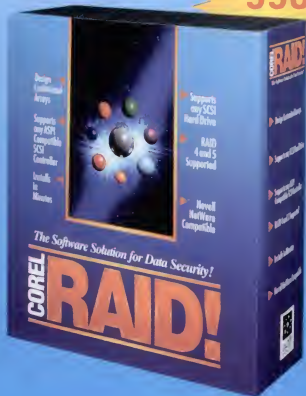
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HOW WE TEST / from page 69

E-mail interoperability via MHS

added six file attachments totaling about 1.4MB. The files included one executable file of 227KB, one database file of 71KB, one ASCII file of 780KB, one graphics bit-map file of 38KB, a word processing document of about 114KB, and a spreadsheet of 202KB.

Each test message was addressed to users on all the E-mail products on the system (10 users in the To: list, two users carbon copied — see sidebar below for addressing details), and sent. We checked each of the recipients' stations and recorded the features that made it through and those that dropped out (priority, word wrap, etc.). We extracted the file attachments to disk and verified the files against the originals. Then, at each destination, we replied to all original recipients if possible. We checked all the original recipients' stations to see if the replies arrived. At the originating station we replied to the reply and made sure it got to its destination.

SCORING INTEROPERABILITY:

Message: We examined the incoming message at each of the recipients to see if the subject line was complete and uncorrupted. The path was awarded 3 points if

the subject was complete, 2 if the subject was truncated to 24 characters or more, and 0 if the subject was truncated to fewer than 24 characters and/or corrupted. The path was given 5 points if the incoming priority was set correctly, 0 if not. We checked the originator for a return receipt.

The message text was checked for completeness. If the entire message arrived, the path was awarded 8 points. Admittedly, the test message was unusually large for normal use on E-mail, so we gave the path 4 points if only a small portion was cut off. No path cut the message enough to award fewer points.

If the original word wrap survived, we gave the path 2 points. Any change in word wrap brought the score to 0. If the message arrived as a single message with all file attachments, we gave the path 2 more points.

Few paths earned a full 25 points. As would be expected, the MHS products BeyondMail, Da Vinci, and Futurus earned 25 points in this category when sending messages to themselves. In addition, Microsoft Mail for AppleTalk Networks picked up 25 points when sending to itself, even through MHS.

Attachments: If all six files arrived and were verified to be transferred without errors, we awarded 12 points to the path. If, when the files were saved, the original file dates were intact, we added 3 points. If the names were listed and associated with the files, we added 10 points.

Here again, it was usually products sending messages to their own users that earned a full 25 points, but some had problems doing even that. cc:Mail sent only one of the six files, even to itself. Only BeyondMail and Da Vinci got the original file dates to more than one recipient, and few did it at all.

Addressing: A foreign address is a route that causes a message to pass through a gateway, without regard to the E-mail product that receives the message. A local address is a route that, to the originator's perspective, wouldn't cause the message to pass outside the local E-mail system.

We counted the number of foreign addresses that were still in the original To: list when the message arrived at its destination. If all were intact, we awarded 6 points. If fewer, we scaled down the number according to the percentage of addresses that made it. If the foreign cc: address survived, we awarded 2 points. If the local address in the To: survived to its destination, we awarded 6 points. If the local address in the cc: list survived, we

gave the path 2 more points.

We checked each destination for the accuracy of all the addresses of the original recipients. A completely accurate list earned 8 points. We scaled the points down according to the number of inaccurate or missing addresses in the list. If the address in the list of original recipients was presented in a friendly manner (for example, a user name without a complete gateway path), the path earned 1 point.

Replies: At every destination of a given test message, we replied to all original recipients when possible. (WordPerfect Office does not have this feature.) If the originator received the reply, we gave the path 6 points. If all the addresses that were foreign in the To: and cc: lists received the reply, we gave it 6 more points, fewer if only a partial list received the reply. If the local origin (local to the originator) in the To: list received the reply, we added 6 points. If the local origin in the cc: list received the reply, we added 2 more.

If the originator could reply to the reply (and the message was received), we added 5 points to the score.

The maximum number of points a path could get in this category was 25. cc:Mail had the most problems replying to original recipients because they often received a truncated and corrupted list of addresses.

Foreign addressing vs. local addressing

It is important to distinguish between the two types of addressing we used: foreign and local. We considered any address that caused the message to pass through a gateway to be a foreign address. This was true even if the destination was ultimately the same mail product. For example, an address for a message sent to a cc:Mail user to another cc:Mail user was considered foreign if the message had to pass through an MHS gateway in order to get back to cc:Mail.

A local address was any address where the message never left the realm of the originating E-mail product. This would be a cc:Mail message sent to another cc:Mail user without passing beyond the cc:Mail system.

We mixed foreign and local addresses in our destination list in order to see how return addresses (the list of original recipients) got to their destinations. You should be able to send a message to several people at once, with some of them on your local E-mail system and others on some other E-mail. Ideally, each destination should get an accurate list of original recipients regardless of how the message was addressed.

This seemingly simple concept of mixing local and foreign users actually creates a rather complex problem. Suppose a QuickMail user sends a message to three people — one is a local QuickMail user, one is a WordPerfect Office user who must be accessed via the MHS gateway, and the third is a BeyondMail user who is accessed through the gateway. When the QuickMail user builds the To: list, it will contain a simple QuickMail address for the local user, say, Simon Peters. It will contain a foreign WordPerfect Office address directing the message through the gateway, such as mel@wpo, where mel is the user name and wpo is the logical name of the WordPerfect-MHS gateway. And it will contain the Beyond-

Mail foreign address, such as ndulst.brai@entris, where ndulst is the MHS name for BeyondMail user Nancy Durlister, and entris is the logical name of the target MHS hub.

In order for the BeyondMail user to reply to all original recipients, QuickMail or its gateway has to be smart enough to expand his local buddy Simon's address to all the addresses on the BeyondMail list to see the address as something like apeters@qmmhs. If BeyondMail only gets the user name Simon Peters in the original To: list, the message will be all dressed up with nowhere to go.

To test this, we addressed each message to 12 recipients, 10 placed in the To: list, and two as carbon copy recipients. For those products that were not MHS-native, nine of the To: addresses passed through an MHS gateway to get to their destination (to users of the eight other E-mail products, and one round trip through the gateways and back again to a user on the originating E-mail product), and one address was local. Of the two cc: recipients, one passed through a gateway, and the other was local.

In MHS-based products, where more of the recipients were directly connected to MHS, only six of the 10 To: recipients passed through a gateway to get to their destination. The remaining four were local. Of the two carbon copy recipients, one was foreign, the other local.

All the products seemed to attempt to assemble proper return addresses, but two seemed to overdo it a bit. QuickMail added our QuickMail post office (enterprise) to the address, which was unnecessary. Somewhere in the Solaris Mail To: connection, the local address was expanded beyond belief, particularly when it got to Da Vinci eMail. The address, which should have been cat@smtp (cat@node), arrived as cat@smtp (cat.smtp@cat.smtp@node)@smtp. Needless to say, the reply didn't go through.

MHS-based products: Vital statistics

BeyondMail for Windows

Version 1.0

Standard Edition, 10 users: \$995

20-node expansion pack: \$1,995

100 nodes: \$9,500

BeyondMail, in Cambridge, Mass., can be reached at (617) 621-0095.

cc:Mail for Windows Platform Pack

Version 1.11

Each post office: \$495

25 users: \$845 per post office

100 users: \$3,295 per post office

cc:Mail Gateway: \$1,295

cc:Mail Inc., a division of Lotus Development Corp., can be reached in Mountain View, Calif., at (415) 335-6400; fax: (415) 961-8400.

Da Vinci eMail for Windows

Version 2.0

Combo starter pack (includes both DOS and Windows), 10 users: \$799

DOS starter pack, 10 users: \$499

Five-user increase: \$249

30-user increase: \$1,299

Da Vinci Systems Corp., in Raleigh, N.C., can be reached at (800) 328-4624.

Futurus Team DOS/Windows Combo

25 users: \$2,495

100 users: \$2,995

Futurus Corp., in Atlanta, can be reached at (404) 392-7979.

Mail-Link MHS Gateway for QuickMail

Mail

10 users: \$595

20 users: \$995

100 users: \$2,995

Site licenses are available

Mail-Link MHS Gateway for Microsoft Mail for AppleTalk Networks

10 users: \$595

20 users: \$995

100 users: \$2,995

Site licenses are available

StarNine, in Berkeley, Calif., can be reached at (510) 649-4949.

Microsoft Mail 3.0 for PC Networks

10 users: \$695

Microsoft Mail 3.0 Gateway to MHS

\$595

Microsoft Mail 3.1 for AppleTalk Networks

10 users: \$395

Microsoft Corp., in Redmond, Wash.,

can be reached at (206) 882-8080.

QuickMail, Version 2.51

10 users: \$599

100 users: \$4,699

CE Software Inc., in West Des Moines,

Iowa, can be reached at (515) 224-1995.

S-Bridge Electronic Mail Gateway between MHS and SMTP

\$595

Computer Mail Services, in Southfield,

Mich., is at (313) 352-6700.

Solaris Mail Tool, Version 3.0

(Bundled with Solaris)

SunSoft Inc., in Mountain View, Calif.,

can be reached at (800) 227-9227 or (415) 366-0171.

WordPerfect Mail for Windows

Version 3.1

WordPerfect Connection Server

Version 3.1

Five-user pack: \$495

Each additional user: \$75

20-user pack: \$1,295

WordPerfect MHS Gateway

Version 1.0

\$495

WordPerfect Corp., in Orem, Utah, can

be reached at (800) 451-5151.


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InfoWorld Product of the Year, March 1992

BYTE Magazine Reader's Choice, June 1992

BYTE Magazine Award for
Cross-platform E-Mail, March 1993

Network Computing's Certified Interoperable
Application Award, December 1992

Network World's Enterprise
Technology Award, December 1992

Software Digest's Highest Overall Evaluation,
8.7 Rating, 1992

MacUser Editors' Choice Award, 1992

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REVIEWS

LANdesk Manager brings it all together

Integrated environment provides seamless local and remote monitoring capabilities

BY MARY CARLETON REVIEW BOARD

Intel Corp.'s LANdesk Manager is a relative newcomer to the LAN management arena. Building on the work of its competitors and succeeding where they failed, Intel has produced a complete management system that includes almost anything a Novell administrator could wish for. Just about the only thing missing is SNMP (and perhaps the kitchen sink). However, there is a product called Intel SNMP Services that sits on top of LANdesk and links it to an

SNMP console, such as Hewlett-Packard Co.'s OpenView.

Like Novell Inc.'s NetWare Services Manager or Saber Software Corp.'s Menu System for Windows, LANdesk Manager, Version 1.01 provides an integrated shell with a consistent interface for multiple utilities. However, unlike Novell, which only integrates packages designed to fit inside its systems, and Saber, which provides a Windows Program Manager replacement and a programming language to use it, LANdesk Manager provides its shell as an application underneath Windows' Program Manager. This neatly avoids possible installation conflicts like those created by Saber and is much more extensible than Novell's solution.

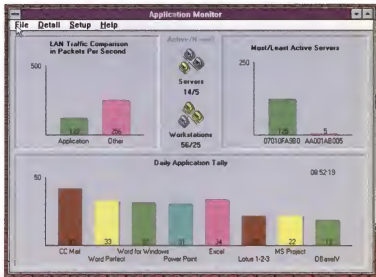
Inside LANdesk's special environment, referred to as the Control Panel, you can not only install any standard Windows application (with its icon), but you can also create subfolders to organize your desktop. LANdesk also introduces the concept of objects, which can be created within LANdesk's folders.

Objects can be and do almost anything. They were designed to document and automate tasks for the user, much like a macro, but at a level that manipulates entire programs. By doing this, the administrator can leave and be confident that complex monitoring tasks will be performed without a hitch. Intel licenses LANdesk by the server and not by the workstation, which means you can use multiple workstations to run administration tasks, all of them working from the same server directory.

Another feature that has become a unfortunate necessity on most networks is periodic virus checking and elimination. LANdesk includes both Windows and DOS-based on-demand virus scanning capabilities that can check everything from all available volumes to single files or subdirectories. The DOS version can be used on non-Windows stations or put into batch files for scanning at log-in time. If a virus is found, you can delete infected files, rename them with a .VIR extension, or attempt to clean them. Cleaning a file will remove a virus, but it won't fix any damage that the virus may have done. Intel maintains a database of known viruses on its BBS. LANdesk owners may update their local databases as often as they like at no charge, other than the long-distance toll.

Not strictly part of LANdesk Manager, but included in the bundle, is Spy Inc.'s Air for Windows. This is a TCP/IP communications package for Windows that provides Telnet or FTP file transfer services with TCP/IP-based networks. LANdesk uses drivers from the AIR disks but otherwise does not automatically install the package.

LANdesk's competitors are Microcom Inc.'s LanGuard (reviewed September 21, 1992, page 105), ADI Systems Inc.'s LanExec (reviewed December 14, 1992, page 83), Saber's LAN Workstation (reviewed January 11, page



LANdesk's Application Monitor function gives the administrator detailed information about application usage.

61) and Novell's NetWare Services Manager (reviewed March 1, page 62). For this review we scored LANdesk based on a combination of the score cards for both LANlord and LanExec because, unlike those two, LANdesk does both software metering and remote monitoring.

NETWORK MONITORING:

LANdesk provides direct access to all of Novell's NetWare tools, such as FConsole and PConsole, as well as a host of its own. Included is a packet analyzer called Traffic Monitor, which shows a real-time histogram of all packet traffic on the network. Default filters include sifting for Broadcast Packets, Novell Packets, TCP/IP Packets, EtherTalk I/II

the Alert Logger. Double-clicking on the red statistic will take you to more detailed screens.

The Traffic Monitor makes it easy to follow both workstation-specific and network-wide traffic patterns by tracking not only packet flow, but also error rates, utilization, and protocol statistics.

Other monitors included in the LANdesk Manager package are the Server Monitor that detects the comings and goings of available servers without flooding the network with extraneous traffic and the Queue Monitor to follow the activity of all network print queues. The Queue Monitor is very useful for balancing the loads on network printers. LANdesk's network monitoring is most comparable to LANlord.

LANdesk provides direct access to all of Novell's NetWare tools, such as FConsole and PConsole, as well as a host of its own.

Packets, and Hardware Errors. You can create other filters and apply them to particular stations or sets of packets and simultaneously display statistics for as many as eight active filters (including one that counts all packets). LANdesk enables you to set both upper and lower threshold triggers for each active filter and a minimum duration for the statistic to be "out of spec." You can also enter separate messages for High and Low warnings, as well as separate severity levels.

When an error occurs that triggers an alarm, its statistic turns red on the monitoring screen, and LANdesk makes an entry in the Alarm Log and passes pertinent information about the alarm to

We rate network monitoring very good.

REMOTE MONITORING:

In order to monitor more than one server remotely, you must purchase multiple copies of LANdesk. However, LANdesk's menus are set up to distinguish among multiple servers with no special actions necessary other than choosing the servers to be monitored. Therefore, if you have multiple packages installed, there is no difference in what you can do on local and remote networks.

Using Desktop Access, another LANdesk module, the administrator can remotely control users' workstations to

REPORT CARD INFO WORLD

LAN MANAGEMENT SOFTWARE

LANdesk Manager

VERSION 1.01

Criteria (Weighting) Score

Performance

Network monitoring (100) Very Good

Remote monitoring (75) Excellent

Software metering (75) Very Good

Workstation inventory (50) Very Good

Querying and reporting (50) Very Good

Documentation (75) Very Good

Setup (125) Satisfactory

Ease of use (175) Very Good

Support

Support policies (75) Good

Technical support (100) Satisfactory

Value (100) Very Good

Final score **7.0**

PRODUCT SUMMARY

Company: Intel can be reached in Hillsboro, Ore., at (800) 538-3373 for sales and information or (800) 525-3019 for the fax-back service.

List price: \$995 per server, unlimited workstations.

Requires: Administrator's workstation: Intel 386 or compatible 33-MHz 80386 or higher; 8MB of system memory; Microsoft DOS 5.0 or later; DR DOS 6.0 or later; Microsoft Windows 3.1 or later running in Enhanced Mode.

Pros: Features are easily accessible; smoothly integrates third-party packages; cleanly supports remote servers; unlimited workstation support.

Cons: Somewhat expensive for small network; no automatic housekeeping of ever-growing inventory database; setup assumptions don't suit all configurations.

Summary: LANdesk is a complete, well-thought-out LAN management package with a few minor setup glitches.

troubleshoot or update a user's station without physically being there. A Chat utility also enables remote users to send messages interactively. An additional program that comes bundled with LANDesk gives these same capabilities to the administrator when dialing in over a modem. By remotely controlling the administrator's workstation, with appropriate password protection, the administrator can tend to the day-to-day administration of the network without having to be on-site.

LANDesk Manager's Desktop Access

utility also makes it easy to directly transfer files to and from remote workstations, a feature that simplifies both remote maintenance and troubleshooting. We rate workstation monitoring excellent.

SOFTWARE METEERING:

LANDesk uses an optional TSR installed on the administrator's workstation, called the Application Monitor, to monitor software usage and the consequences of that usage. Like LANlord, it will not restrict the usage of applications beyond their licenses, but it does make it possible to

track who is using what application and how many users are using it at a time. The Application Monitor works at the file-transfer level to note what traffic is going between which hosts and workstations. This level of information facilitates balancing of application loads.

The Application Monitor also maintains several logs that record all file transactions on the network. By using user-creatable Application Definition Files (ADFs) to associate files with specific applications, you can track the impact of applications by watching all active files, not

just the executable most closely associated with an application. There is also an auto-naming function that filters user log-in names and later associates users' names with a particular workstation, replacing the default numerical IDs. Network usage can be tracked by the application monitor or by the workstation. Overall, Application Monitor is a very versatile tool for monitoring network applications.

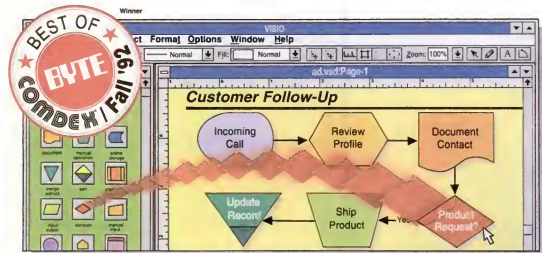
Intel recommends, and we concur, that you run the Application Monitor on a dedicated machine, both because it is a resource hog and because you will want to have it running continuously. We rate software metering very good.

WORKSTATION INVENTORY:

LANDesk maintains an inventory of each workstation's hardware, software, and installed drivers. LANDesk maintains inventories in a single database for easy querying. However, each inventory is performed independently. This separation allows you to perform a more lengthy software inventory at specified intervals rather than during every log-in. If you have purchased LANDesk for multiple servers, you can choose to have the inventory database maintained on only one server, or you can have each host maintain its own. Intel suggests 200 as a maximum number of workstations per inventory server to maintain response-time levels. You can also manually integrate data from workstations that aren't attached to the network. Once inventory data exists in the inventory database, you can add additional information such as contact name or workstation serial number. You cannot, however, add entirely new entries to the database.

LANDesk currently recognizes approximately 1,000 different software packages. LANDesk maintains this information in an ASCII text file that you can modify. The hardware inventory is comprehensive. Log-in IDs are entered

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LANDesk recognizes approximately 1,000 different software packages.

into the inventory, to which you can attach a picture file (.BMP) and a sound clip (.WAV). Intel suggests that you use these to display a scanned photograph of the owner with the proper pronunciation of the person's name.

Intel has also given some thought to maintaining the database. Not only can you delete individual component records, you can delete all records associated with a given workstation should that station be removed from the network.

By default, there is no record kept of changes to a workstation's configuration between log-ins, but you can ask LANDesk to maintain a log of all such changes. This log can then be read in its entirety or filtered for specific information. According to Intel, this feature is not automatically invoked because the log file can become quite large and the only way to purge it is to delete it after unloading the inventory NLM from the server.

Also by default, LANDesk scans are performed on all workstations that log in to the server. If you want to override this

scan, you can use the included Agent Manager to customize individual log-in scripts. We found LANdesk's inventory capability to be at least as complete as that of other inventory packages and significantly easier to use than many. Workstation inventory is very good.

QUERYING AND REPORTING:

LANdesk has two areas of querying and reporting: querying the inventory database and exporting information about the network at large. We evaluated network querying in the network monitoring section.

Intel has gone out of its way to make it easy to query the inventory database. In order to logically track information, you can set semipermanent filters for individual components that you wish to track by pointing and clicking from a list of all available components. You can ignore these filters without removing them, enabling you to see all available inventory statistics. You can superimpose pre-existing filters for just hardware, just software, or just supplemental components, in any combination, over your own filters.

You build queries by pointing and clicking from lists of available components, available values, and available logical operations. Once you have generated your report, you can view or print it or you can save it to a file in either ASCII or Comma Separated Variable (CSV) format. You can also import it directly into Excel using Dynamic Data Exchange. We rate querying and reporting very good.

DOCUMENTATION:

The documentation set consists of four volumes and a trifid quick-setup guide. The *User's Guide*, a hefty 682-page tome, does a thorough job of describing LANdesk without overwhelming the reader. Intel has nicely balanced explanatory text with user questions and answers, troubleshooting information, and diagrams. There is an detailed index and glossary.

A second manual describes how to use a modem to access and fully control a remote PC, including the administrator's station. The third manual, aimed at the novice administrator, is devoted to demonstrating how to use LANdesk to solve general network problems. There is also on-line help. Intel has put a lot of effort into its documentation set. We rate documentation very good.

SETUP:

The automated setup procedure for LANdesk is a snap. One innovative feature Intel added is a text log of all changes that the install performed, as well as a to-do list of all steps that still need to be manually done, such as loading NLMs on the server. Intel also includes choices of full default and itemized custom installations. The only problem is that LANdesk assumes that all users use their AUTOEXEC.BAT files to log themselves onto the server at start-up. If this is not the case, there will be no error messages during installation, but they will appear during execution. You can customize the process or install the software manually from the workstation. We rate setup satisfactory.

EASE OF USE:

Given the complexity of LANdesk, Intel did a reasonable job, but even so, you will need to wade through the guide. We were able to decipher most of the functions without the manual, referring only

to on-line help. For its complexity, the package is easy to use. We rate ease of use very good.

SUPPORT:

Support policies: Intel provides multiple avenues of technical support. Support hours are 7 a.m. to 5 p.m. Pacific time, weekdays (Thursday hours are 7 a.m. to 3 p.m.). There is a fax line, and Intel has a BBS with current updates, a Computer Service forum (GO INTELFORUM), and an automated fax-back information service. Support policies are good.

Technical support: Calls to technical support are first routed through an automated system, but after about 2 minutes you will reach a live operator. We waited on hold anywhere from 3 to 9 minutes.

We give high marks to the technicians for politeness and helpfulness, although they were unable to assist in complicated problems. On balance, we rate support satisfactory.

VALUE:

Once the product is installed and working correctly, it one of the best LAN

management products that we have seen. At a list price of \$995 per server with unlimited nodes, it is also competitively priced for mid-sized and larger networks, especially those with few servers and many nodes. Also adding to its value is its capability to smoothly incorporate third-party packages within its own structure, making it almost infinitely extensible. Value is very good.

Mary Carleton is a member of InterLink, an international consortium of network consultants in Onalaska, Wash.

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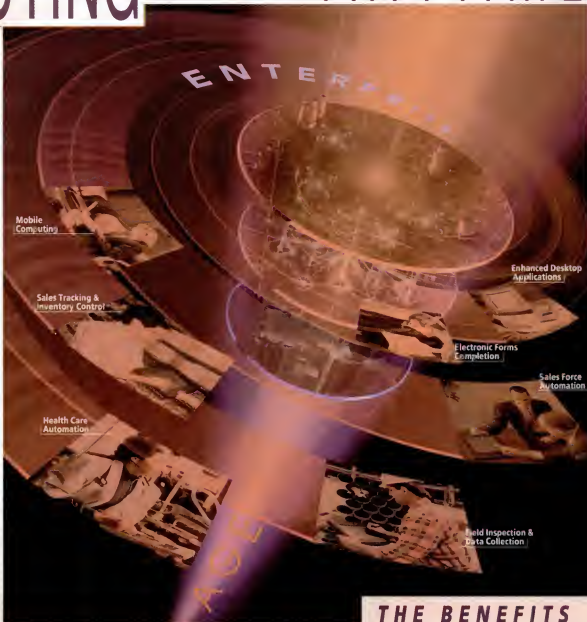
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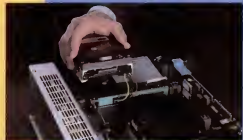
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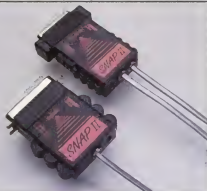
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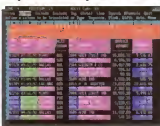
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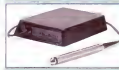
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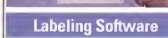
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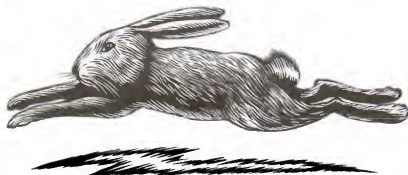
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Application Development Programs

These tools let people build custom applications mostly by moving and linking objects on-screen. To arrive at a task-oriented program, the InfoWorld Test Center staff will use four different packages to build the same application and assess how easy they are to use and how well they shield the user from having to write additional code. The products tested will be Parc Paper Systems' Visual Works for Windows, Microsoft's Visual Basic for Windows, DigTalk's Parts Workbench, and Series Corp.'s Series Developer Pro.

Network Interface Cards for Servers

With 32-bit EISA bus architecture, these NICs have the horsepower required by network servers. InfoWorld's editors evaluate more than a dozen leading products in the category, including server NICs from Cabletron, Compaq Computer Corp., Cnet, Intel Corp., Racal, SMC/Western Digital, and 3Com. We'll test and compare them for performance, compatibility, flexibility, and value.

OCR Software

With a new generation of products on the market and rough agreement among manufacturers on a standard set of "recognizable fonts," optical character recognition now delivers greater accuracy. But OCR also faces the challenge of more and more fonts coming into common use, not to mention "The Age of the Fax." To compare six OCR products — including Caere's OmniPage Pro and Calera's WordScan Plus — InfoWorld's editors will run them through several common document scanning tasks, including photocopies and documents that mix text and graphics, and report on their accuracy and ease of use.

Diagnostic Software

Diagnostic utilities packages serve both as preventative medicine and as trouble-shooters for desktop systems. Based on results from a task-oriented suite of tests, InfoWorld compares some half dozen diagnostic products, including Check-It, QA Plus, WinSteuth, and Slighty. We'll run them through memory, hard disk, floppy drive, I/O port, and configuration checks; see how quickly they are in various system optimization tasks; and report on their all-around diagnostic, system analysis, and problem-solving capabilities.

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DEC sales force to sell Macs, support VITAL

By Tom Quinlan
and Jayne Wilson

Apple Computer Inc. acquired an ally last week in its efforts to establish itself as an enterprise computing provider, announcing that Digital Equipment Corp.'s direct sales force will now sell Macintoshes.

As part of the agreement, DEC will also support Apple's Virtually Integrated Technical Architecture Lifecycle (VITAL).

Apple is counting heavily on VITAL — a way of integrating multi-entry platforms — to gain entry into the mainstream corporate world.

DEC's support of VITAL gives Apple its first partner in establishing the architecture in an enterprise environment.

The agreement covers all of Apple's products, except the Performa, Mac Classic, and LC

lines — products oriented more toward individuals than corporations.

As an Authorized Apple Service Provider, DEC will also be able to service the systems, including Apple's recently announced server products.

Although Apple declined to comment on its Workgroup Server 95 data server bundled with Oracle7, sources close to the company expect that DEC — with its capability to service and support database users — could be one of the primary sales channels for that product.

"We'll sell these products through our direct sales force," said Tom Austin, DEC's U.S. sales program manager. "This agreement is a way of rounding out our systems integration business for those customers who want systems integration that includes non-DEC PCs," he said.

Currently, Digital has several agreements with Apple, including a Pathworks engineering agreement, a teaming agreement for systems integration.

"Lots of our customers ask for Macs," Austin said. "DEC's customer base has a larger percent of Macintosh products than the rest of the industry. Many customers are happy with both Apple and DEC products like Pathworks and System 7, so this is a win-win situation for both companies."

Although this is the first agreement of its kind for Apple in the United States, Apple signed a similar agreement in 1991 with DEC to cover Europe, said Michael Yam, business development executive for the enterprise market division. "We have a clear synergy [with DEC] here," Yam said.

A principal reason for Apple entering the agreements with IBM was to set standards that would offer a real alternative to Microsoft/Intel-based PCs.

"To accomplish that, we need an enthusiastic IBM as a partner," said an Apple executive who asked not to be named. "We didn't do this so we could continue to go after 15 percent of the market."

Some analysts believe the new IBM chief won't tamper with the Apple alliance. "IBM is committed to the PowerPC," said Frank Dzuback, president of Communications Network Architects Inc., in Washington. "Gerstner will identify IBM's core technologies and then develop them. And the PowerPC is a core technology."

"A lot will depend on who Gerstner names as his No. 2 man. That's the guy who's going to make the technology decisions for him," Dzuback said.

Other company was responsible for the problems with his high-speed modem.

Delrina's woes may be tied to its rapid growth, which has averaged 100 to 300 percent a quarter. Delrina, publicly held, has more than a 70 percent share in the Windows fax software market, according to analysts.

Delrina also tries to support all 300 fax boards on the market, some of which have troubling idiosyncrasies. "There are few standards in this area," said company representative Shelly Soffer.

This, combined with many novice users, is creating the false impression that the WinFax product has undue problems, the company said.

InfoWorld's gripe line, for users complaining about vendors, is [800] 227-8365, Ext. 710.

IBM / from
page 1

IBM customers want downsizing help



Incoming IBM CEO Louis Gerstner (left) was introduced in New York last week with former CEO John Akers.

its OS/2, AIX, PowerPC, and RS/6000 products.

"Today there are no answers as to how you migrate high-investment installed bases to these new architectures," McGraith said. "This means all our choices could be dangerous ones."

To its credit, IBM, under outgoing CEO John Akers, embraced open standards over the last year with plans for systems ranging from \$2,000 to \$2 million. Those systems would use the PowerPC and RS/6000 processors running various versions of OS/2 and AIX.

"IBM was [once] a company that embraced standards only to smother them," said Will Zachmann, president of Canopus Research Inc., in Duxbury, Mass. "Today you could make the case that no other company more genuinely fosters industry standards."

Bob Holmes, manager of technology evaluation for Southern California Gas Co., and other corporate managers want Gerstner to get more technologies out of the lab and into the market.

"Within IBM there has been an enormous amount of effort spent on keeping things from coming to market," Holmes said. "He needs to know what's in the labs that could produce some meaningful revenues."

Meanwhile, analysts and other observers applauded last week's job cutbacks. "[Gerstner] should accelerate the overhead reduction," said Stephen Dube, an analyst at Wasserstein, Perella & Co., in New York. "He should have three things in his game plan: decentralize, decentralize, decentralize."

Charles Wang, chairman of Computer Associates International Inc., agreed. But he cautioned, "He needs to give a sense to the employees that he is going to reduce the size of the company just once; otherwise it is demoralizing to the remaining employees."

NOVELL / from
page 1

Novell readies scalable software router

rently evaluating NLSP.

"We see NLSP as having good potential," said Glenn Wenig, Cisco product manager for desktop protocols. "It addresses many of the problems associated with building large networks. It's an opportunity for us. NLSP is another routing technology we need to support."

Various protocols will be implemented by mid-1994 through a series of NetWare Loadable Modules, which will support source routing bridging for IBM environments, DeNet, the Point-to-Point Protocol, and Open Shortest Path First.

Novell officials say NLSP provides a reliable, open systems approach necessary for the future of routing. Reklai said Novell is designing its technology to take advantage of emerging key

technologies, including Novell's Open Data-link Interface (ODI) technology, which will enable more than 1,000 existing LAN adapters to support router functions. He also referred to high-end Novell's such as Intel's Pentium, Digital Equipment Corp.'s Alpha, and 100Mb-per-second Ethernet.

"We will be able to route all traffic that the larger routers do," Reklai said.

Industry analysts noted that NLSP is Novell's attempt to play a bigger role in the enterprise.

"NLSP is set up to make NetWare faster in the WAN environment, while IPX is set for LAN traffic," said Michael Howard, president of San Jose, Calif.-based Infonetics Research.

SCULLEY / from
page 1

Gerstner era won't impact Apple

third-party partners — including Motorola Inc. and Groupe Bull — development of the PowerPC chip and PowerOpen is expected to be complete this year.



Apple CEO John Sculley said IBM is still enthusiastic about working with Apple.

DELRINA / from
page 1

Will beef up technical support service

solves the communications problems that Microsoft Corp.'s driver has with high-speed modems. Specifically, this refers to Class 2 and 14.4-kilobit-per-second devices.

Windows memory allocation problems were resolved in a maintenance release that was "slipstreamed" into the product in January, the company said. Delrina officials would not reveal the exact bug fixes addressed in that release.

Meanwhile, users are complaining about unresponsive technical support from the company.

In February we had a 300 percent increase in calls for WinFax," said company repre-

sentative Joseph Zankowicz.

To solve the problem, the support staff has been boosted to 74 employees with more on the way, Zankowicz said. The company will increase its 35 incoming lines by 50 percent "in a very short while," he said.

One frustrated customer, Digital Equipment Corp. engineer Gerald Goodrich, said, "I spent 2 1/2 hours on long distance phone calls, mostly on hold." His problem finally got solved, he said.

Another customer, Paul Prows, a manager at Accuware in Salt Lake City, said the department refused to help him, as did the fax board manufacturer, because each claimed the

REVIEWS / TEST DRIVES

First Look / Nicholas Petreley

Clarion compiler technology is sure to heat up market

Clarion is about to undergo a major shift in its underlying compiler technology that will make Clarion-built programs scream. Coupled with its new plug-and-play approach to database compatibility, this product should be hot. Really hot. So hot it could make Clipper programmers jump ship. And the next time FoxPro programmers rush more, it could be to the competition.

Clarion is a database applications programming environment based on a Cobol-like language. It has a tightly integrated set of rapid development tools, including what I think is the best screen painter around, a report writer (not included in our beta copy), a template-driven applications generator, a source code debugger, a database browser, a data dictionary manager, and a handful of other top-notch indispensable utilities.

Clarion shares the DOS-based business database applications development market with Clipper, FoxPro, Dataflex, dBase, Paradox, and Advanced Revelation. Some of these products provide end-user tools; Clarion does not.

As with Clipper and FoxPro, Clarion turns your applications into DOS executable (.EXE) files. Many developers see this as a significant advantage because, according to conventional wisdom, database applications run faster when they're compiled into executables. They may, but experienced applications programmers know that if you want real speed, you have to take the trouble to program in a "real" language such as C or Pascal. Database languages built for rapid development and convenience carry too much overhead to compete with languages like C—until now.

Clarion is the first and only database language of its kind to offer a compiler comparable to a C compiler. Though this fact may elicit little more than a yawn from all but programmers (First Looks are written by folks like me, but only a programmer could bore a tree), this is the stuff of applications developers' dreams.

When Clarion Software Inc. merged with Jensen & Partners International, Clarion inherited JPI's TopSpeed technology, which drives its TopSpeed C and C++ compilers. As a result, Clarion compiles its programs that run much faster than those written in a typical database language.

How much faster? We wrote a series of simple benchmarks that tested sheer language overhead. In one test, Clipper took 2 hours and 15 minutes to finish. FoxPro took a little longer. The Borland C compiler took 60 seconds to run (compiled with options set for maximum speed).

Clarion took just 29 seconds. Even when we hit Clarion's former Achilles' heel (operations that convert data such as a string to an integer killed Clarion performance in the past), it only lagged behind the Borland C programs by seconds. Clipper and FoxPro consistently trailed in all our tests by a factor of 100 or more.

Clarion has made some impressive improve-



ments in other areas. The only thing I don't like about the product is the default collection of templates used by the applications generator. But there is a small but adequate template language manual for those who want to design their own templates.

There are some nice cosmetic changes in Version 3. Clarion includes a couple of flashy additions to screen handling, for example. With the flip of a switch, your application's windows will zoom, fade, or pull down like a window shade. Clarion, and applications built with Clarion, now support a smooth scrolling mouse cursor, real check boxes and radio buttons, and a graphical desktop even when you run in text mode. (All text modes are supported.) You can write programs that use GIF and PCX graphics files, which can be displayed in Super VGA mode. In addition, Clarion is going to sell an add-on that gives your applications a full-fledged three-dimensional GUI look and feel.

Clarion has expanded its database support by going to a plug-and-play approach. Version 3.1 will ship with database drivers for Btrieve, C-tree, all Xbase formats, Paradox, various ASCII file types, and, of course, Clarion's database file format. Drivers for SQL Server, Oracle, NetWare SQL, and SQLbase are in the works. The use of any given driver is almost transparent to the programmer. For the most part, programmers can change their minds about which drivers to use by changing the file definition, not by changing existing code.

The new data dictionary manager lets you predefine a field's default display characteristics, field validation criteria, key relationships (one-to-one, one-to-many, etc.), and referential integrity constraints—even across dissimilar database formats.

Clarion skimps almost nowhere in the \$995 package. The utilities and their integration are honed for the programming mentality. The screen painter is crafted to save time and effort. A pop-up calculator, ASCII, and key code and color code chart exist in almost every menu. The DOS shell and file manager rivals some third-party offerings.

Programmers tend to find a set of development tools and stick by them with an almost irrational sense of loyalty. It's a rare product that generates enough excitement to lure some of them away. Clarion 3 could be one of them.

Clarion, in Pompano Beach, Fla., can be reached at (305) 785-4555.

Nicholas Petreley is the InfoWorld reviews and testing senior editor for enterprise computing. First Look examines new products before they have been through a formal review.

MACINTOSH VIDEO UTILITY

Radius tool allows video data transfer from Macs

Can send anything Mac displays

By Doug and Denise Green
Contributing Editors

Radius Inc.'s VideoVision, a video production tool for the Macintosh, imports and digitizes video data from composite or S-Video sources and will send anything you can display on your Macintosh to the same devices for recording or flicker-free display.

This easy-to-use NuBus card offers a host of features, including full QuickTime support to facilitate desktop video production.

VideoVision generates up to 24-bit color images on 13-inch displays and 8-bit color on 16-, 19-, 20-, and 21-inch displays. The program uses an external connector panel with 15 ports, which you can mount next to your Mac.

The output ports include an S-Video port and three ports for composite video and stereo audio output. With the software, you can choose from NTSC, NTSC 4.43 (Japan), and PAL formats. There are two sets of inputs for S-Video and composite input. SECAM is only supported for input.

There are two ports labeled Audio Mix In that let you mix audio with your video source. The extension connector will accept other external hardware sources.

To set up VideoVision, simply drop the NuBus card into an available slot, connect your monitor and the external connector panel to the card, and install the RadiusWare control panel software.

Also included with VideoVision are software controls for Enlarged Menu Font for large screens and auto-centering dialog boxes, a screen saver, and a

screen capture utility.

Although the VideoVision users' manual instructs you to use the Movie Recorder application to test the product, that application is not bundled. VideoVision does, however, come with an undocumented application called VideoViewer that we used to quickly test our setup.

VideoVision offers a full-featured board with 24-bit flicker-free video output, an integrated display interface and video encoder, and stereo sound input

VideoVision includes QuickTime support to facilitate desktop video production.

and output. This combination of features makes VideoVision's list price of \$1,999 attractive.

Radius also offers two money-saving bundles. The Education Pack, priced at \$2,399, includes DIVA Corp.'s VideoShop, a full-featured QuickTime editing system that lists at \$599 alone. (See review of VideoShop, August 17, 1992, page 111.)

The Presentation Pack, also priced at \$2,399, is bundled with Adobe Systems Inc.'s Premier and Macromedia Inc.'s Action

Radius, in San Jose, Calif., can be reached at (408) 434-1010.



Radius VideoVision uses an external connector panel with 15 ports, which you can mount next to your Mac.

MIDI SOFTWARE

Master Tracks Pro 4 4.6 makes music with MIDI

BY ALLAN LAMBERT
REVIEW BOARD

Multimedia and MIDI reach complete harmony in the new version of Master Tracks Pro 4 for Windows from Passport Designs Inc. Priced at \$395, Version 4.6 is a delight for the professional musician. It should prove an easy tool for any multimedia application or for nonprofessionals who need music in their presentations. Master Tracks Pro 4 offers complete 64-channel recording with all the bells and whistles, such as SMPTE time code (a format from the Society of Motion Picture and TV Engineers that allows accurate audio-visual synchronization), up to 32-channel MIDI, and real-time or one-note-at-a-time recording or editing. This version also offers MCI support for playing WAV audio files, as well as 8- or 16-bit

A quick-start tutorial had me making music within 20 minutes.

digital audio and CD-ROM support.

PC users can forget about longing for a Mac environment. Master Tracks Pro 4 for Windows actually provides a couple of additional features.

Pro 4 is compatible with any MIDI instrument, as well as Sound Blaster, Pro Audio Spectrum, and AdLib-compatible sound cards. Passport includes a variety of other drivers. And, of course, you must also have Windows 3.x with Multimedia Extensions.

Although the program will run with less, the minimum recommended system configuration is a 16-MHz 386 computer with 2MB of memory. My test configuration was a 40-MHz 386 with 4MB of RAM and a Music Quest MQX-32M MIDI interface.

Installing Master Tracks Pro 4 was a breeze. It found my MIDI interface and set itself up quickly without any effort on my part. A quick-start tutorial and short-cut key reference card helped me to start making music within 20 minutes.

The program's interface is straightforward and should be easy to understand for any Windows user.

I downloaded a sample MIDI song file from CompuServe and used Master Tracks to shorten it and drop the melody out of the middle for a "doughnut." In just a few minutes, I had a serviceable music bed for an advertising jingle.

The only thing I found notably lacking from the program was on-line help and real musical notation. Otherwise, Master Tracks Pro 4 comes with a great bonus disk with Autodesk Inc.'s animation player, supplemental MCI drivers, and several Passport QuickTunes sample MIDI files.

You can reach Passport Designs, in Half Moon Bay, Calif., at (415) 726-0280.

SPREADSHEET ADD-IN SOFTWARE

Excel tool offers graphical controls

BY JOHN WALKENBACH
CONTRIBUTING EDITOR

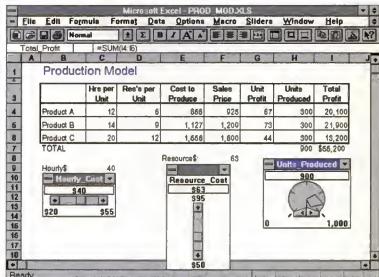
Sliders & Dials is an Excel add-in that lets you create and display graphical controls to quickly change the values in worksheet cells. The program offers vertical and horizontal sliders and a circular dial control. Quattro Pro for Windows provides this type of capability via its UI Builder command. However, using Sliders & Dials is much easier.

After you install the program, Excel displays the new Sliders menu option. Select a cell that you want to vary graphically, then choose the Sliders Create command. A dialog box lets you specify a few options, such as the control type, the minimum and maximum allowable values, the step increment, a name (up to 31 characters with no spaces), and the numeric format that displays in the control. Manipulating the control immediately changes the value in that cell.

Each slider or dial appears in its own window, which is movable but not resizable. You can shrink control windows to an icon, and a "keep on top" option ensures that other Excel windows won't hide the controls. You can create as many control windows as your memory allows.

You can use Sliders & Dials to quickly and easily change input assumptions in a model. Clicking or dragging a slider is certainly faster than moving to a specific cell and entering incremental values. You can set up your model so graphs change instantly in response to moving a slider or dial control.

The controls you create for a particular worksheet are stored with that worksheet file. However, anyone who uses the control-enhanced worksheet must own a



Sliders & Dials offers vertical and horizontal sliders and a circular dial control. These let you quickly change values in Excel worksheet cells.

copy of Sliders & Dials to see and use the controls. Otherwise, the worksheet displays and performs normally without the controls.

There are several things I didn't like about the program. When you create a control, the value in the corresponding worksheet cell automatically changes to the control's minimum value. It would be better to leave the value as is.

Another inconsistency appears when you change a value directly in a "controlled" cell — the value displayed in its control doesn't change accordingly. Then, when you click the control, the control value increments but the work-

sheet value doesn't.

Also, the controls are not fixed in place relative to a worksheet. If you have the controls arranged nicely and then resize the worksheet or activate a different worksheet, the controls remain where they were. So if you work with several worksheets that contain Sliders & Dials controls, you can't immediately determine which control belongs with which worksheet.

Sliders & Dials lists for \$99.95, which seems expensive considering its relatively limited functionality.

You can reach Gordon Technologies, in Lake Oswego, Ore., at (800) 653-2201.

PALMTOP COMPUTER

Latest Wizard palmtop entry sports pen interface

BY TIM ZITTEL TECHNICAL ANALYST

The latest evolution in Sharp's Wizard line of palmtop computers is the Model OZ-9600. The most notable enhancement to this unit is the addition of a simple pen interface. In addition, there's a wireless infrared interface for communicating with other mobile devices (including other Wizards), computers, and printers.

The Wizard uses a small pen input device on a dot-matrix LCD pressure-sensitive screen, which measures 5 1/2 inches by 3 inches and provides 320-by-240 resolution. You can use the pen (or really any object, including your finger) to select, enter information, and control any of the system's various modules, such as the calendar or telephone directory. If you're using the scribblebook module, you can use the pen to write and draw as well.

Unlike full-blown pen-based computers, the Wizard doesn't offer any handwriting recognition capability. I found writing on the screen fairly easy and comfortable, considering the small screen area. However, be careful not to drag a finger along for balance as you write, because it will leave additional markings on the screen.

You can readily call up any information you have stored in the Wizard. Maps, in-

structions, or anything you would use a notepad for can be entered and taken with you. If you have a wireless connection to a printer, you then can have hard copy to go. (This requires an additional adapter for the printer but is well worth it.)

The other significant enhancement to the OZ-9600 is the well-organized Filer, which appears on-screen as an open file drawer with imaginary files and headers visible inside. The headers list existing files, and you can make your selection with the pen. You can then add information to open files by using the keyboard; the pen capability is not active here. Filer also provides a searching capability that will search through any or all of the different modules; there is also a separate Search button.

The Wizard includes several other modules: calendar, scheduler, to-do list, calculator, anniversary list, telephone directory, world clock, outline, user files, and scribblebook. You can add other modules using Sharp's interchangeable cards, which are credit card size.

The Wizard OZ-9600 measures 7 inches by 4 inches by 1 inch and weighs just under 1 pound, with batteries.

I found the Wizard a very usable, albeit pricey (\$649), companion for staying organized and keeping needed information at hand while on the road.

Sharp, in Mahwah, N.J., can be reached at (800) 321-8877.



You can use the pen or any other object to select items.

Mohammadioun: Improv may hurt 1-2-3, but not Lotus

Said Mohammadioun has faced difficult markets before. As founder of Sanna Corp. and creator of *Ami Pro*, 45-year-old Mohammadioun battled Microsoft Corp. for a position in the Windows word processing market.

After selling his firm to Lotus in 1990, Mohammadioun took charge of Lotus Development Corp.'s word processing and advanced spreadsheet efforts. Now he is charged with making *Improv* a success. But instead of just competing with Microsoft and Borland International Inc., Mohammadioun is selling against Lotus' own range of spreadsheets.

Doug Barney, InfoWorld's senior editor, cornered Mohammadioun to find out what struggles lie ahead.

InfoWorld: Why develop a product that competes with yourself?

Mohammadioun: We'd better compete with ourselves before anybody else does. We are in the spreadsheet business and trying to move it forward. We think *Improv* is the kind of technology that can introduce a new generation of spreadsheets.

InfoWorld: What did you learn from the experiment of building *Improv* on Next?

Mohammadioun: It wasn't an experiment. We took the concept of *Improv* to some users and learned they liked it.

InfoWorld: Will *Improv* have any effect on sales of 1-2-3?

Mohammadioun: I hope so.

InfoWorld: What impact are you looking for?

Mohammadioun: Both 1-2-3 and *Improv* are Lotus products, and as long as our customers choose one of our products, we are happy. If the impact of *Improv* is felt on 1-2-3, then it is being felt on the whole spreadsheet market. That means we are getting into our competitors' market share as well.

InfoWorld: What types of users would not be well served by *Improv*?

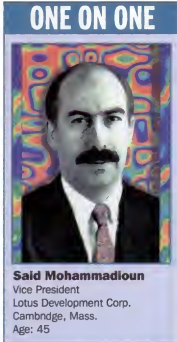
Mohammadioun: We need to let the marketplace tell us, but our experience so far is that it is not so much what kind of spreadsheet user, but what kind of job. The particular design and assumptions of an *Improv* spreadsheet vs., say, 1-2-3 or Excel, tend to make each one of these better for certain kinds of analysis. We are finding interest from power users and new users.

InfoWorld: What tasks are better suited for 1-2-3?

Mohammadioun: Things that don't lend themselves terribly well to being structured. Let's say you were building an ad hoc model to analyze terms of a contract. If I were doing that, I would use 1-2-3. I could build it as I go along, not knowing what is going to come next. *Improv* is not terribly good at that because it is for more structured data where you have categories, and within those, subcategories.

InfoWorld: Would the majority of today's spreadsheet users be able to use *Improv* effectively?

Mohammadioun: I think so — for most of their work.



InfoWorld: Would a lot of those folks use both?

Mohammadioun: We would love to see that.

InfoWorld: Are you tying *Improv* into Version Manager or other elements of your communications strategy?

Mohammadioun: Not at the moment. *Improv* is mail enabled, and it uses all of

the familiar Lotus user interface elements, like Smart Icons, status bar, etc. It also uses Lotus Script, which is the scripting language that we are putting in all our products. For data import, we felt that it was easier to work with Q+E (from Pioneer Software). You can bring in data from everything Q+E supports.

InfoWorld: Some argue that the traditional spreadsheet is running out of gas and is inappropriate for a number of tasks. However, no new paradigms have caught fire, mostly because they were unable to dislodge Lotus 1-2-3. Why will you succeed where others have failed?

Mohammadioun: We've engineered this for more of the mass market. And with *Improv* we don't have to dislodge Lotus. We are Lotus, so that helps.

InfoWorld: Are you holding back on *Improv* to protect the 1-2-3 cash cow?

Mohammadioun: That is a silly notion. If *Improv* cuts into our 1-2-3 sales, it would cut into Excel sales as well. We are certainly not holding back.

InfoWorld: What do you say to those who say *Improv*-type features should be built into the traditional spreadsheet?

Mohammadioun: They don't understand it. This is not an issue of technology alone. There is a set of assumptions built into this product. You can't straddle this decision. You either make those assumptions or not. They can't build this into the next version of their spreadsheet. They could mimic some of the features, but there is a fundamental paradigm difference.

Notes From the Field / Robert X. Cringely

Reason No. 10 for David Letterman leaving NBC: Prefers DOS to Mac

The word came down last week that multimedia computing is dead. Oh, they didn't come right out and say it, but it's true. For 10 years, we've been talking about doing presentations and video and audio and macramé with our PCs, pulling those riches within the IBM compatible category. But it didn't work. Look at the trouble multimedia companies are having just staying in business. Look at the January sales of Tandy's VIS modular Windows multimedia computer: negative six units, nationwide. (Christmas returns, I guess.) That puppy is dead.

Last week's gods of personal computing recognized this by endorsing a new word — *intermedia*, which means using technology to blur the lines between traditional media. Instead of pulling other media into the PC, now we're supposed to ride out and conquer them.

DAVE'S OUT, JOHN'S IN. It's not enough to offer personal computing to the television industry. Those guys won't change if they don't have to. You have to find a way to *compel* them to change. Apple is right now trying the most obvious approach by negotiating to buy the NBC TV network from General Electric.



Don't laugh, because this actually makes a little sense. If Apple buys NBC, they'd get a place to dump some of that \$1 billion-plus in cash they've got sitting around, and GE would become a big Apple shareholder, giving them a stake, at last, in the PC business.

Apple would get a perfect showcase for new technology, forcing the rest of the entertainment industry into a high tech future by *competing* with them. Apple would also gain access to 190-dish network affiliate stations and to the CNBC cable audience, which would

allow them to set up, practically overnight, a national data network using the TV signal's vertical blanking interval. It would require new gizmos, but what Apple makes is gizmos. And what Apple explains why John Sculley has his California house for sale and has bought a new place in Connecticut.

DOS 6, USERS 0. As an international sex symbol of computing, I can't afford to be left behind as Apple and its competitors rush into show biz. That's why I started last week doing high-tech commentary on KPIX-TV, the CBS affiliate in San Francisco. What happens is I lie in bed at home talking on the phone to the station while a computer-animated figure does all the work on-screen.

Talking to a general audience is sure different, though: DOS 6? What's that? *That's* trouble. Sure, 30 million people will run right out and buy their DOS 6 upgrade, but I'm not moving until my applications demand the change.

DOS 6 was pushed out the door before it was ready. Corporate customers are already reporting problems with the disk defragmenter and file compression.

Microsoft was so eager to get a jump on the competition that they surprised

even Compaq with their ship date. The kids in Houston don't even know when they'll switch over production to preload 6.0 on their PCs. Until then, Redmond still gets a royalty on every DOS 3 system sold plus the DOS 6 upgrade bucks. The world is turned upside down by the \$49.95 pricing, too, with Eghedge Discount Software belying its name by not discounting 6.0.

Outside the San Francisco DOS 6 event, Stac Electronics employees handed out coupons allowing users to buy Stackler 3.1 for \$20. Might be a good idea, since Windows NT won't be able to read DOS 6's DoubleSpace volumes. Big mistake.

The only good news for Microsoft this week is that Visual Basic has apparently killed Borland's ObjectVision. Sorry.

"If you've seen Cringely, then you know why we needed to use a virtual reality character," explained Cringely, the KPIX news director. "If only you could see that cute girlfriend of his."

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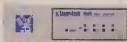


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